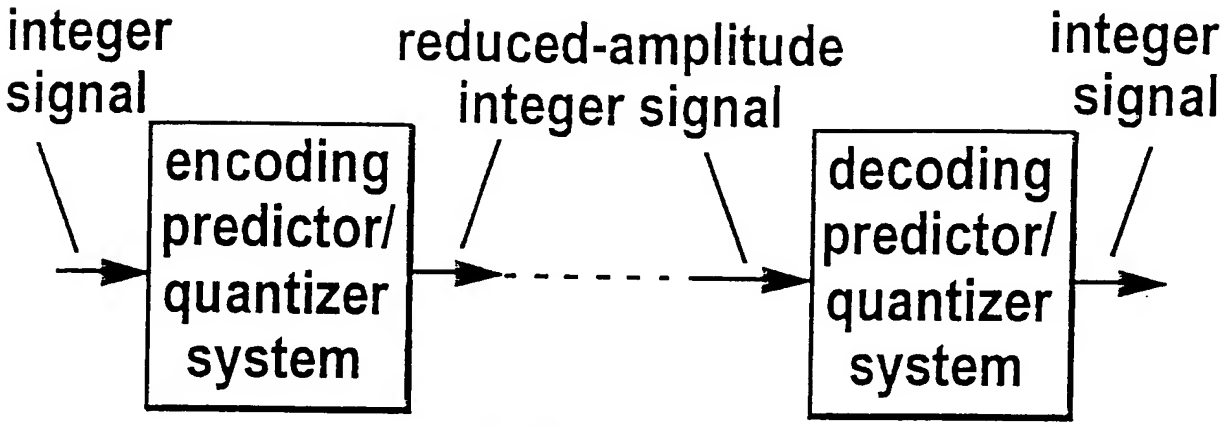

FIG. 1

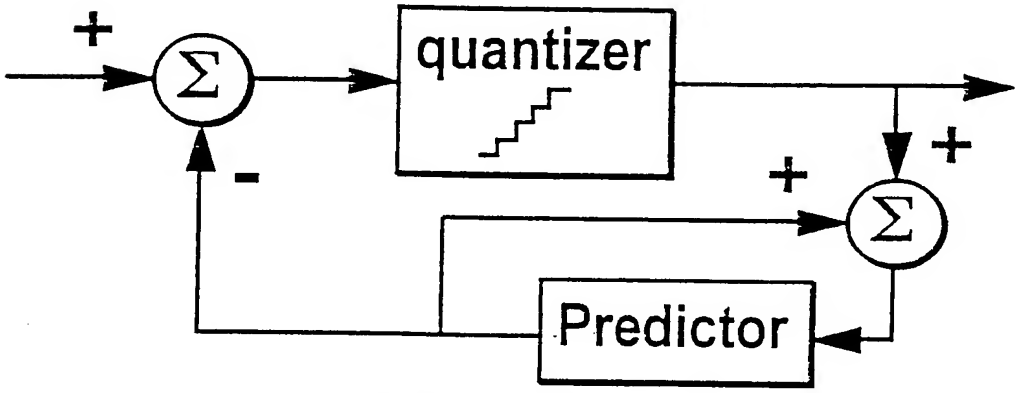

FIG. 2a

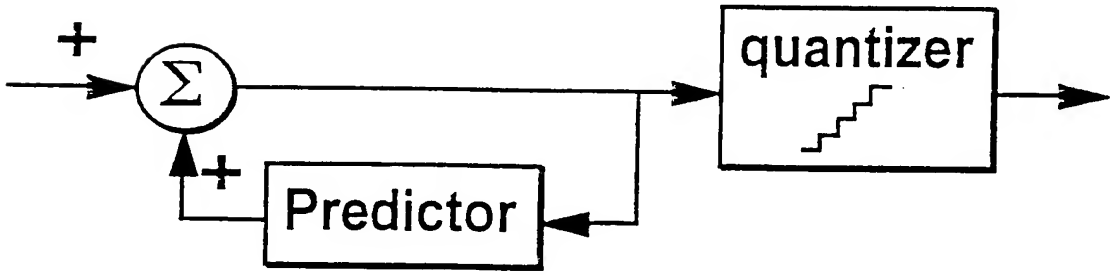

FIG. 2b

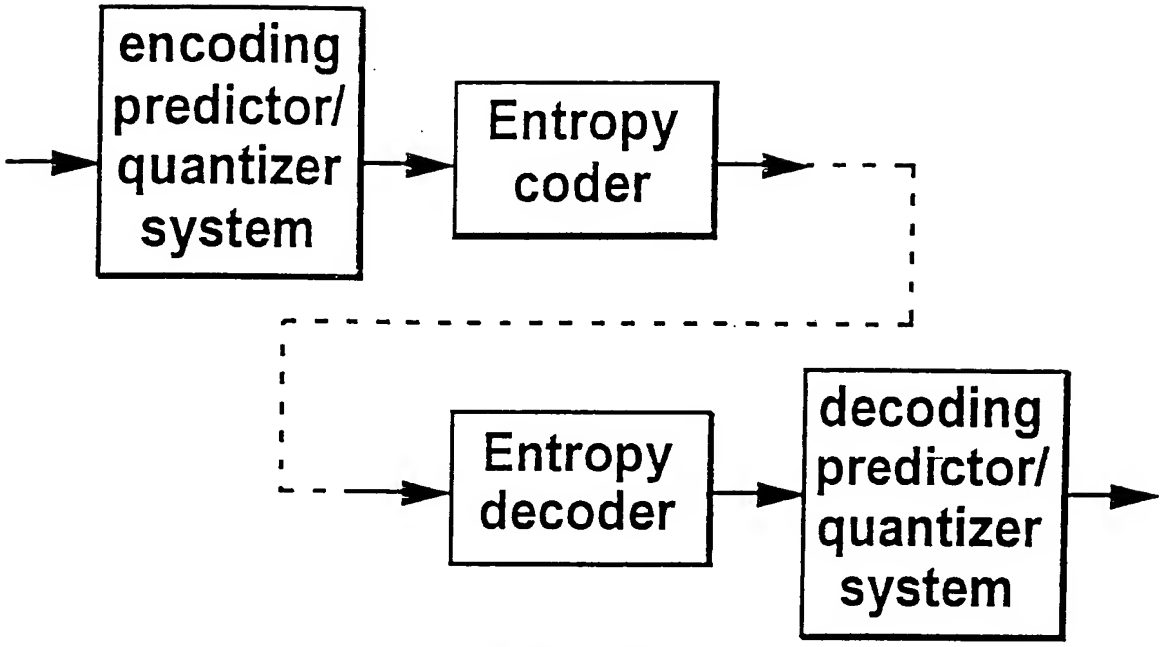

FIG. 3

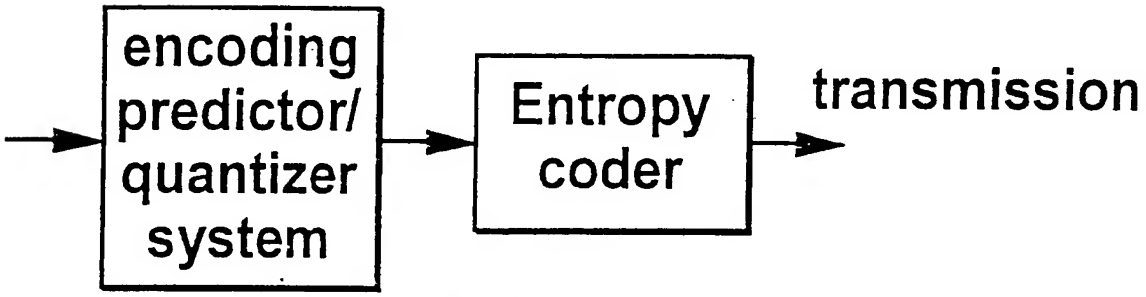

FIG. 4a

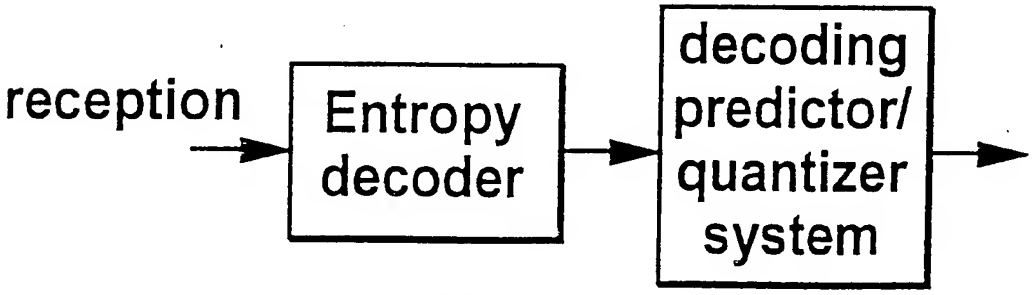

FIG. 4b

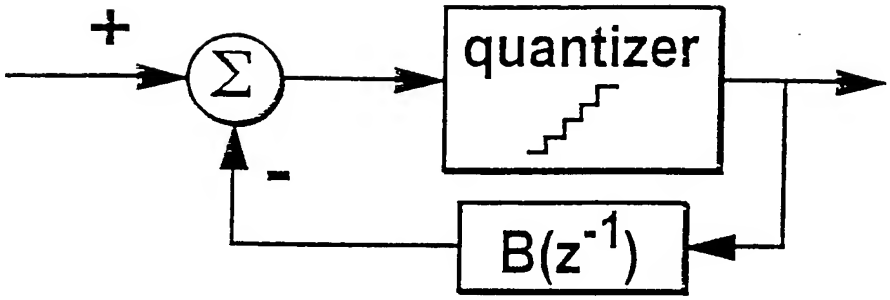

FIG. 5a

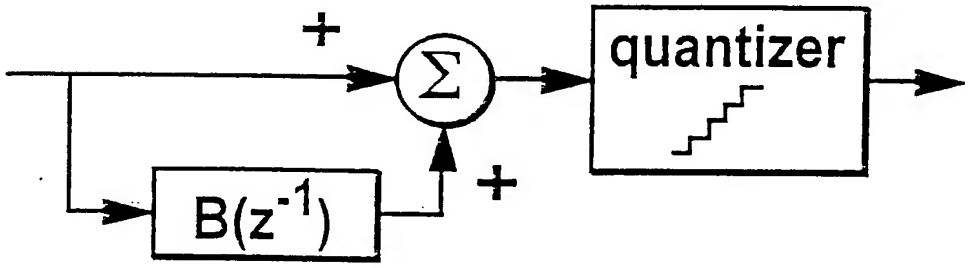

FIG. 5b

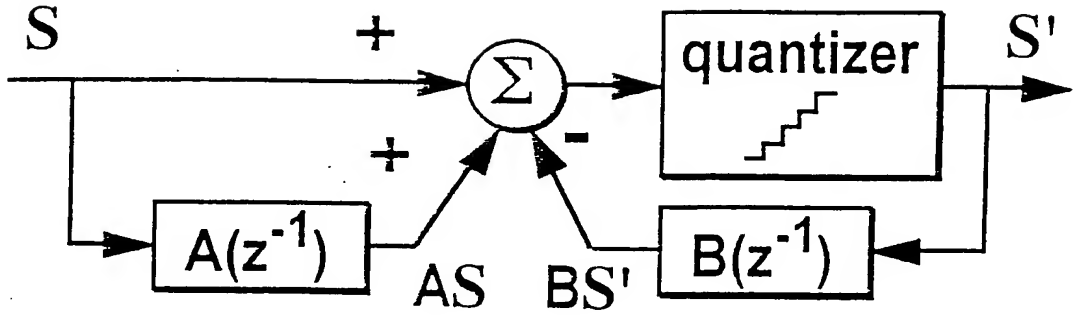

FIG. 6a

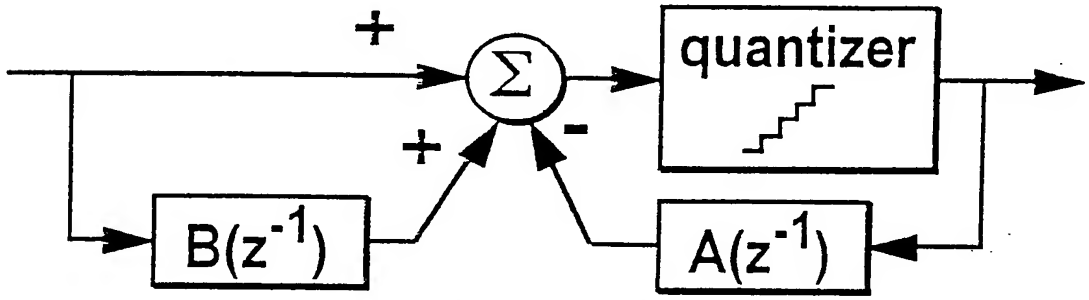

FIG. 6b

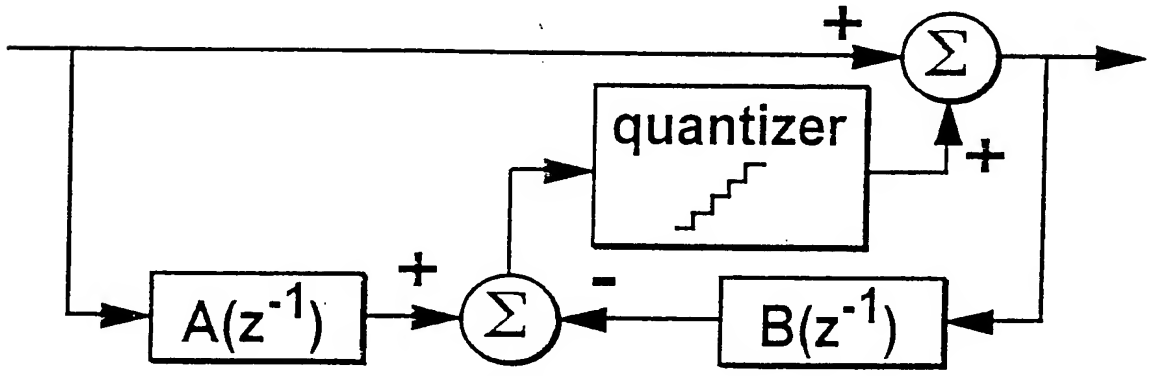

FIG. 6c

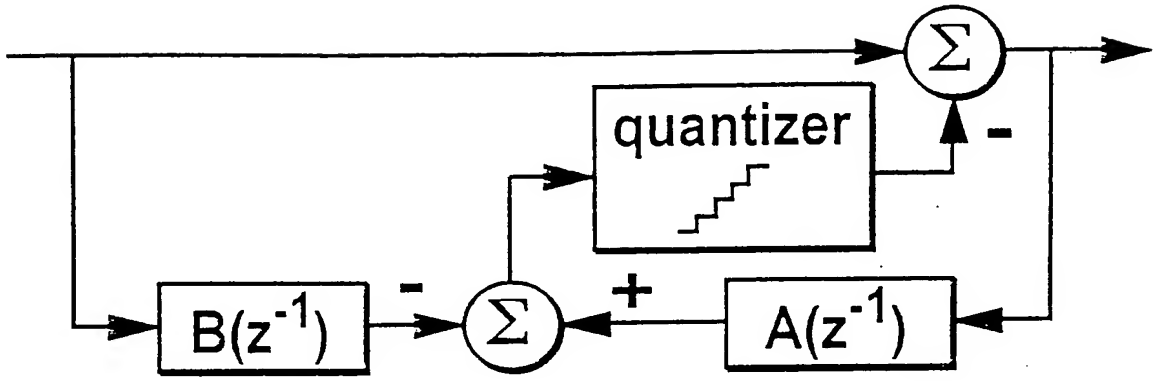

FIG. 6d

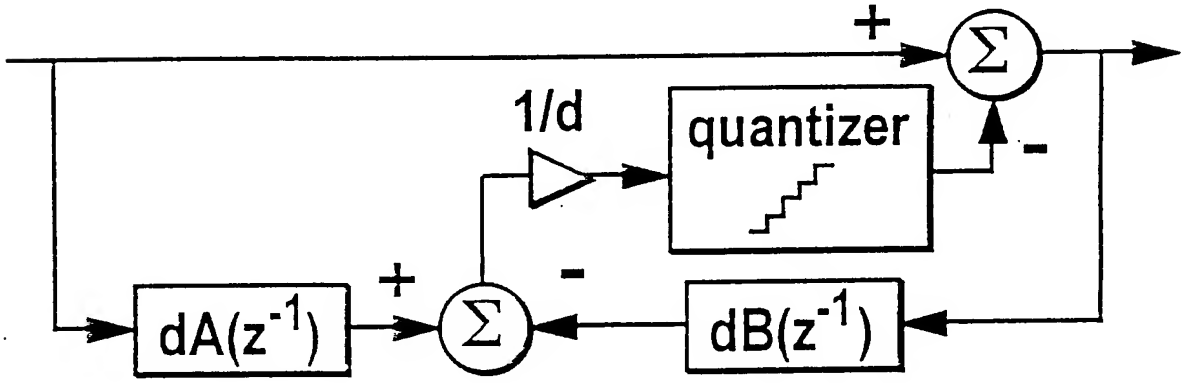

FIG. 6e

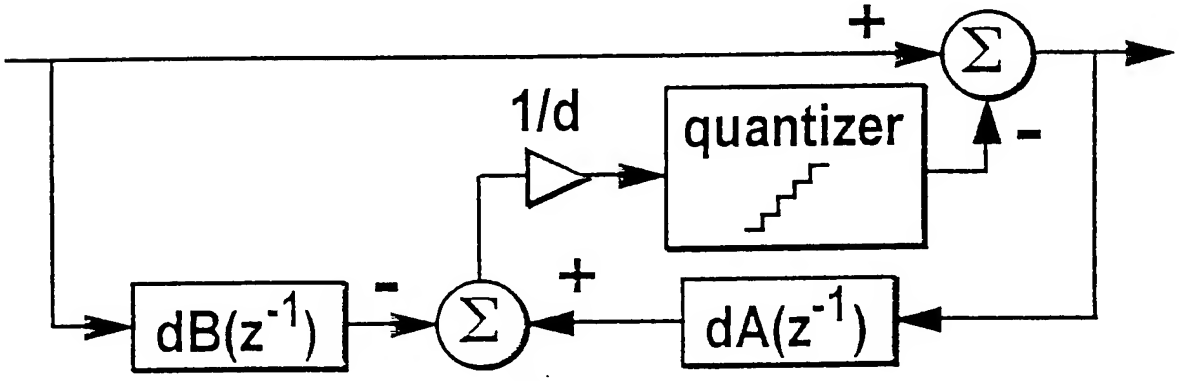

FIG. 6f

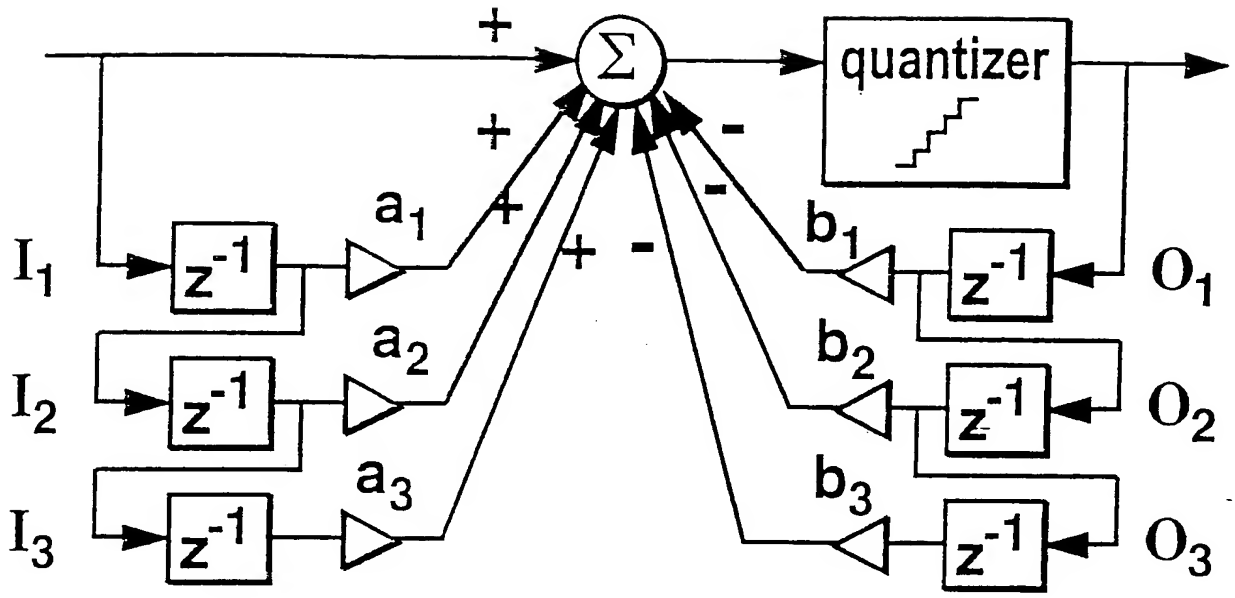
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FIG. 7a

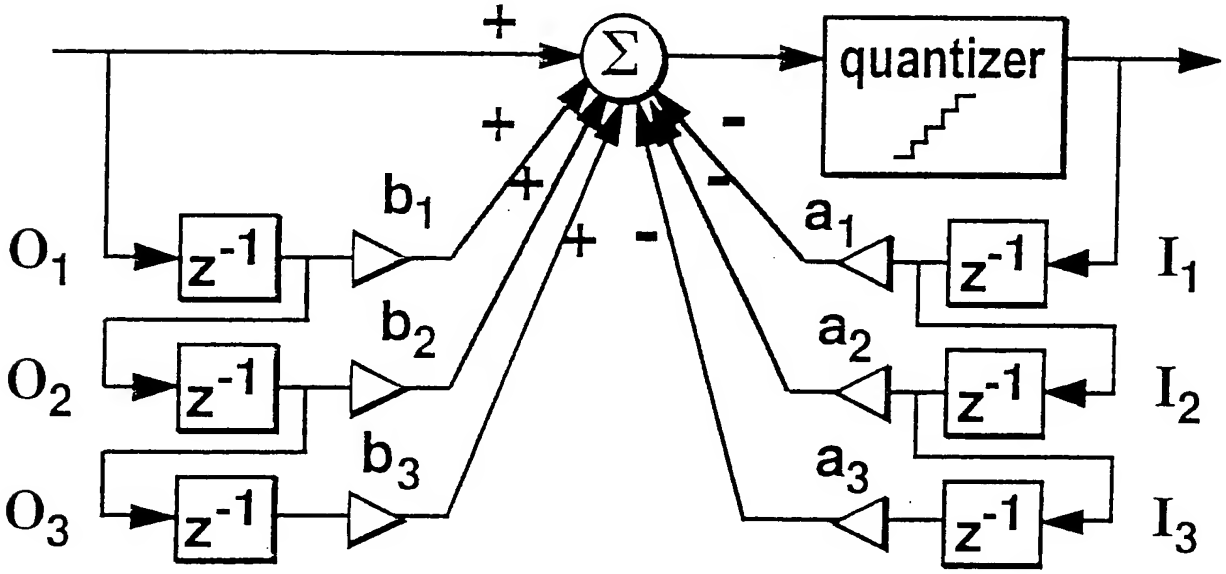
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FIG. 7b

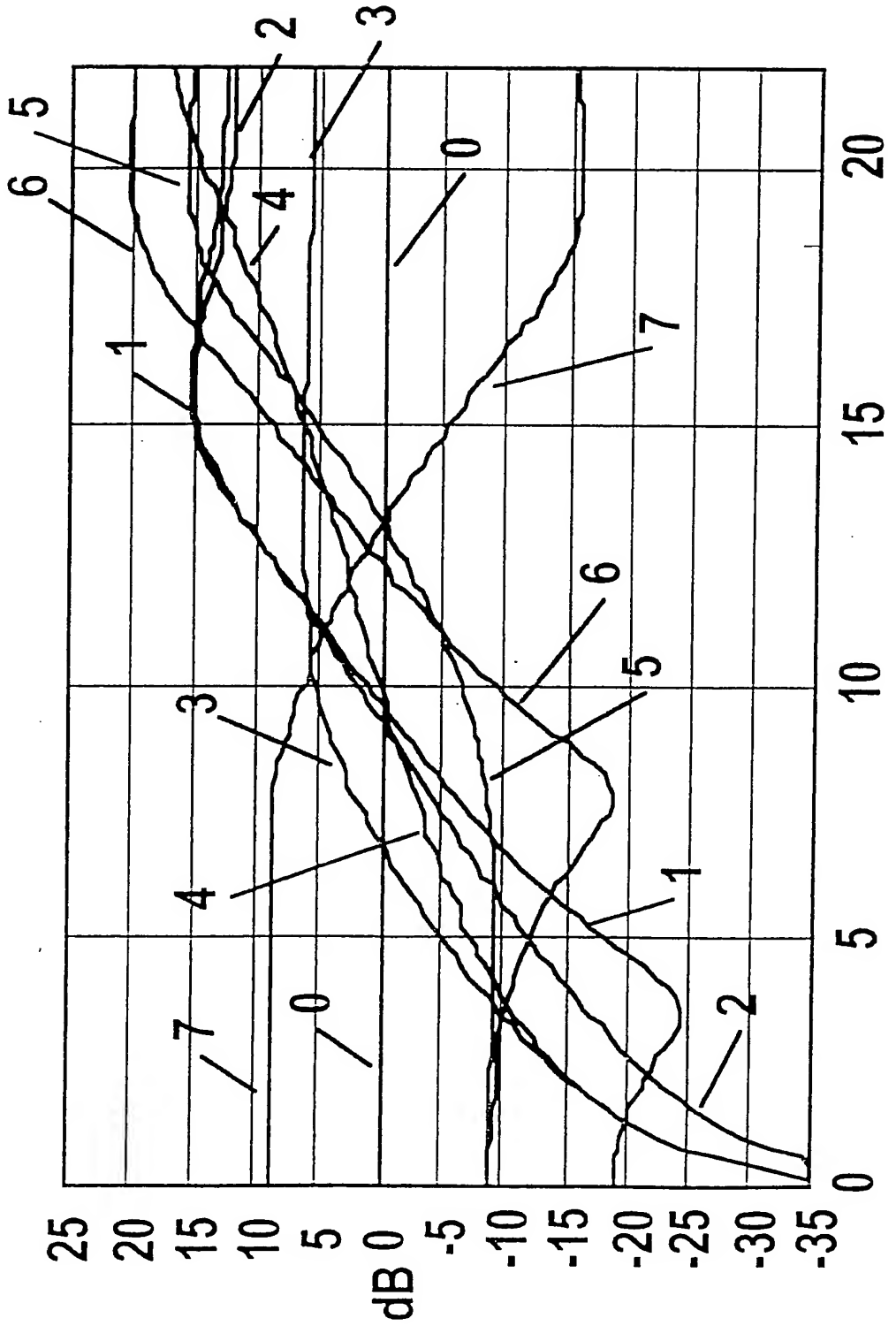
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FIG. 7c

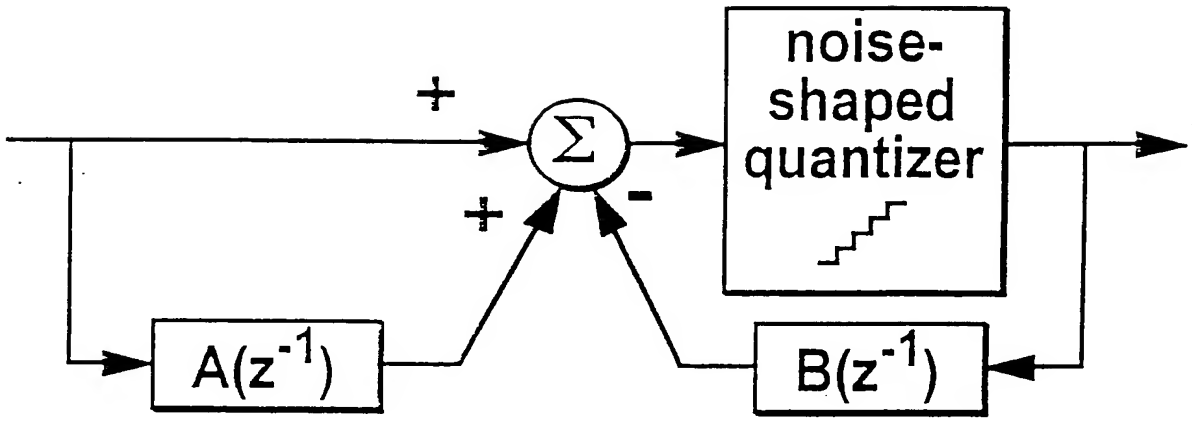


FIG. 8a

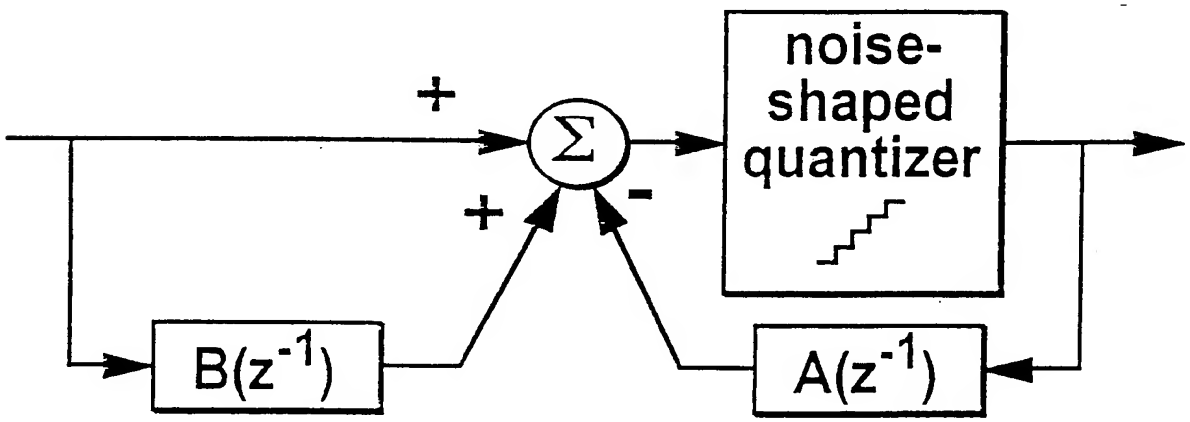


FIG. 8b

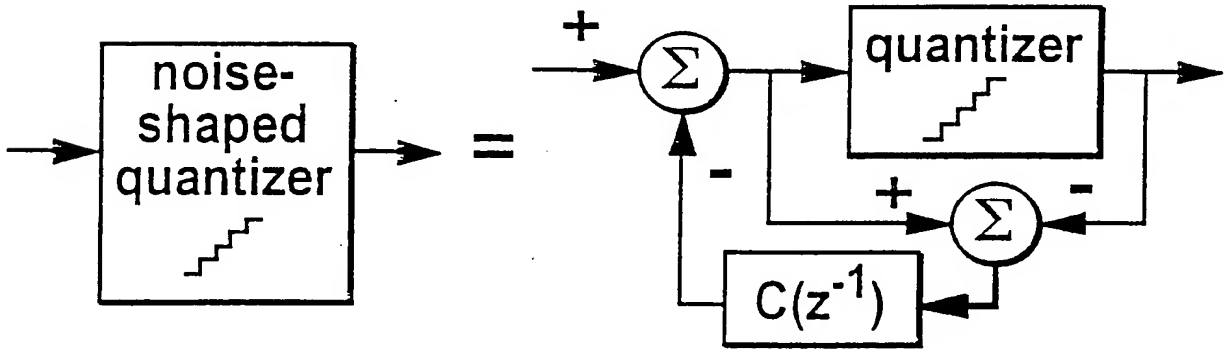


FIG. 9

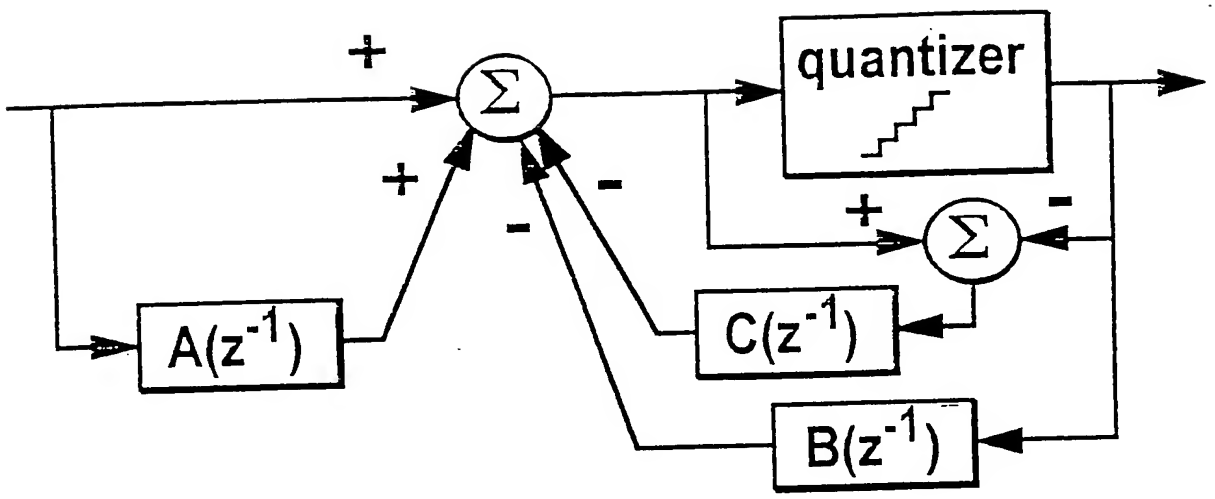


FIG. 10a

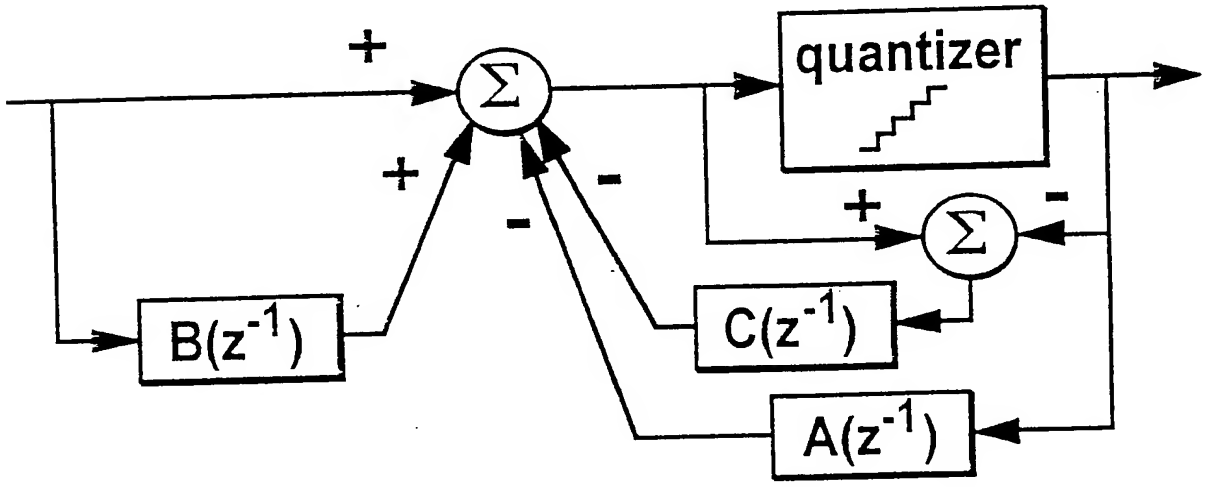


FIG. 10b

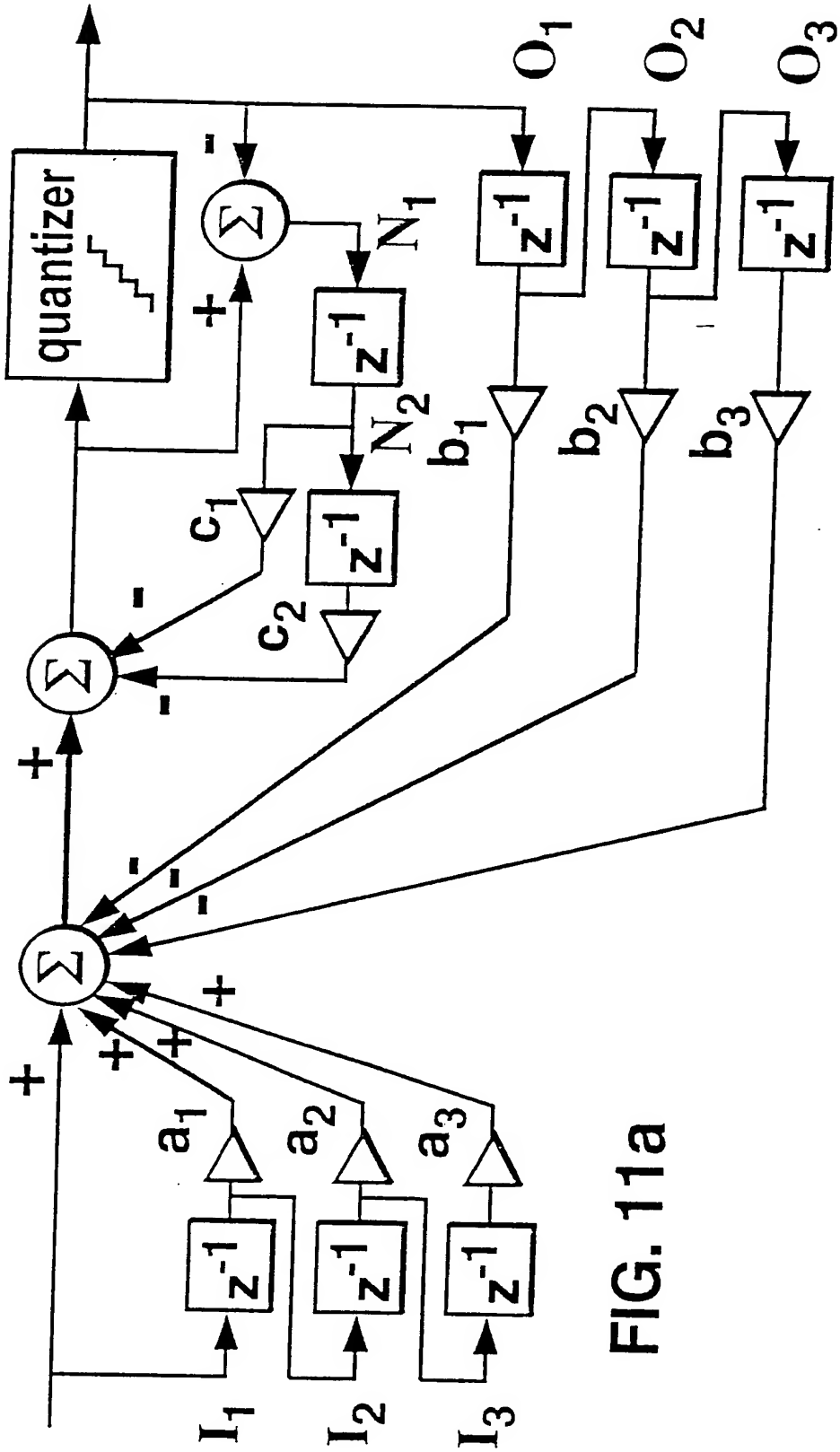


FIG. 11a

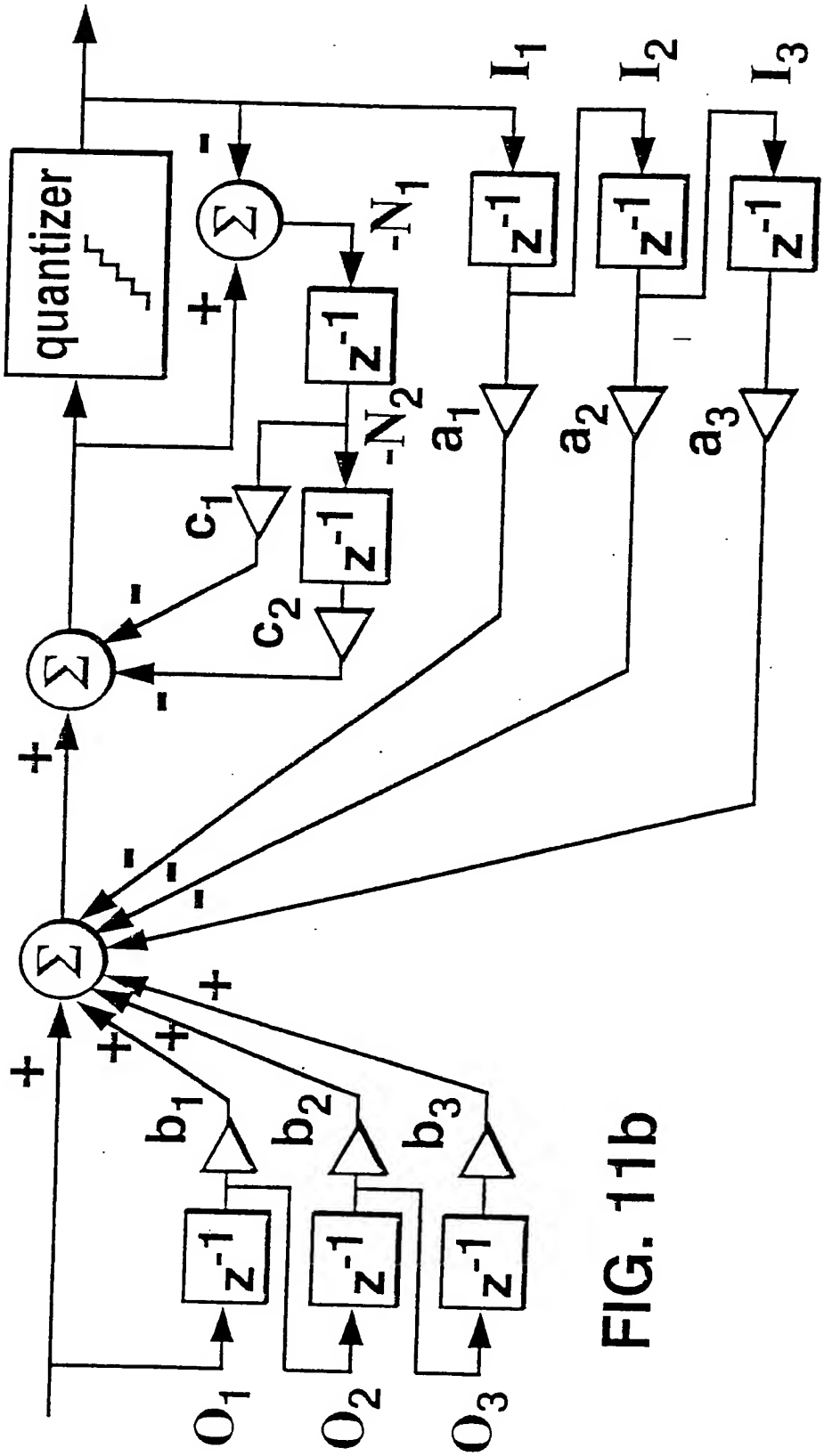


FIG. 11b

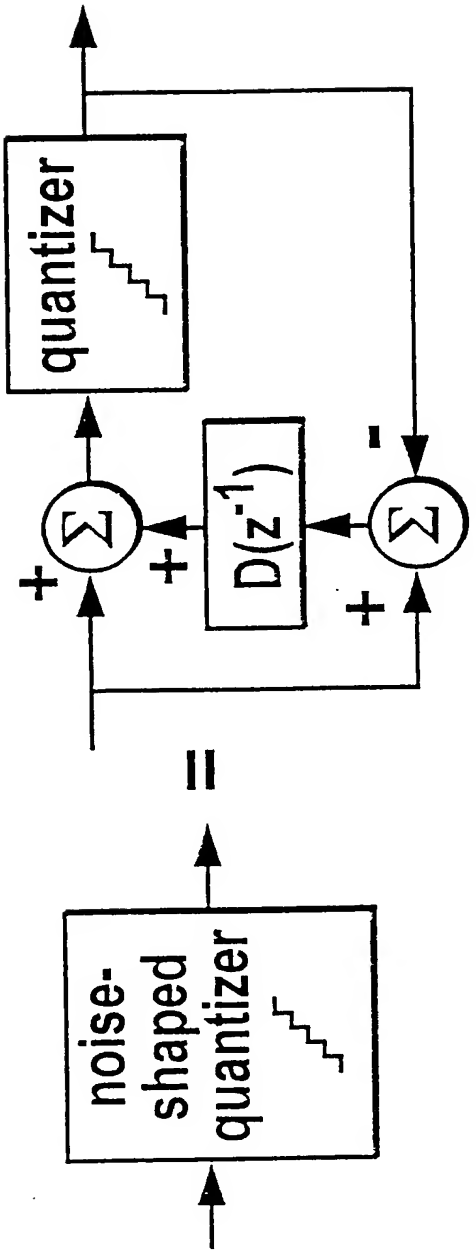


FIG. 12

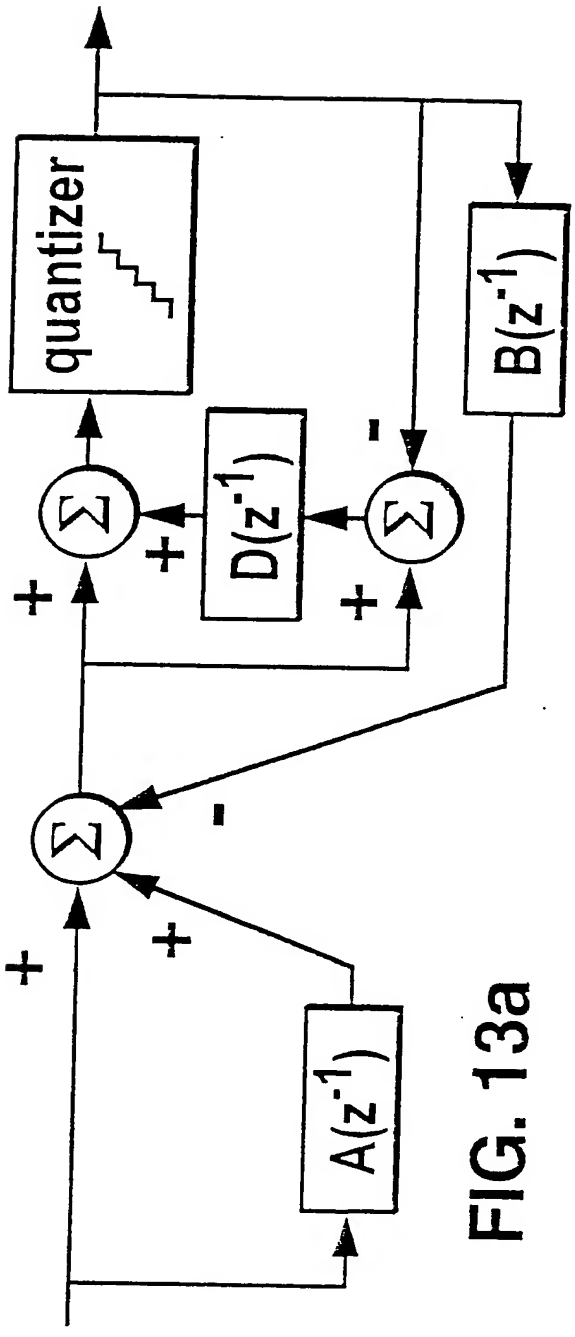


FIG. 13a

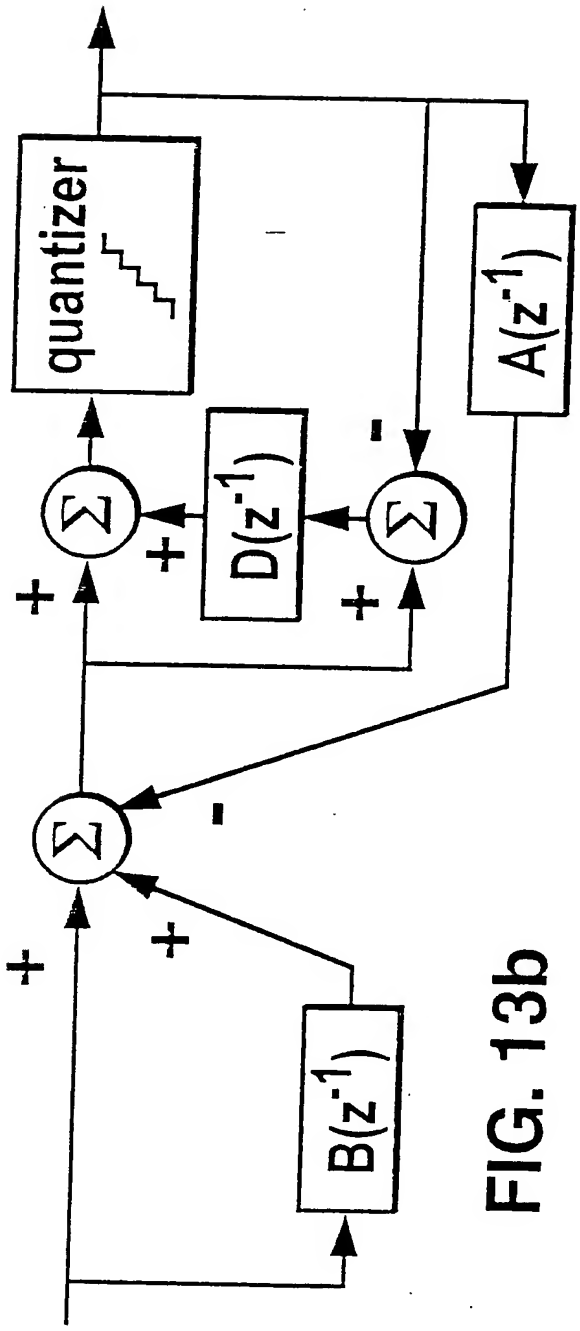


FIG. 13b

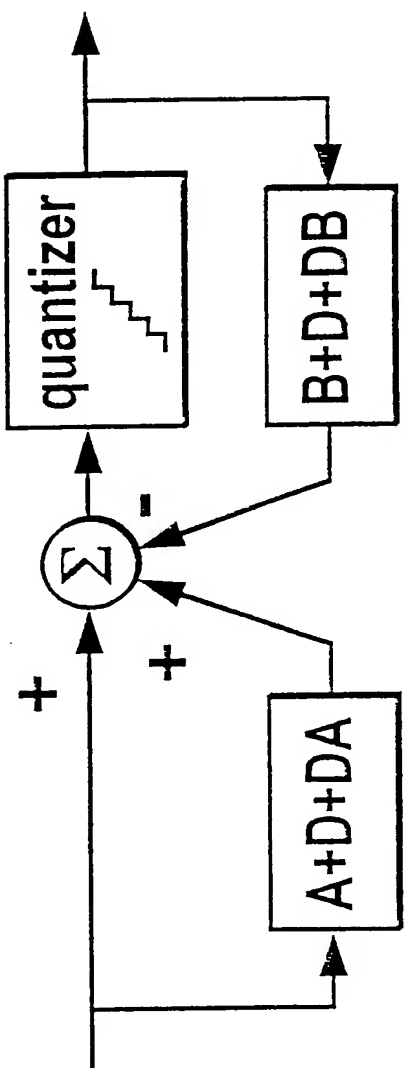


FIG. 13c

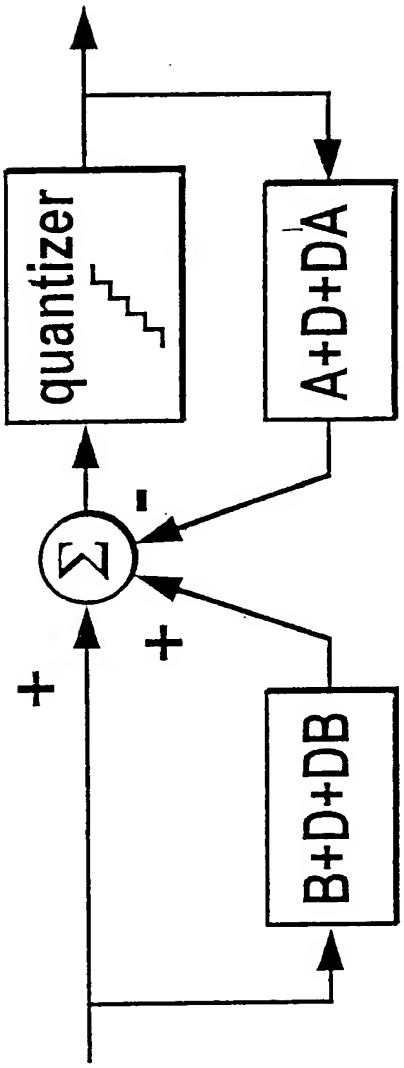


FIG. 13d

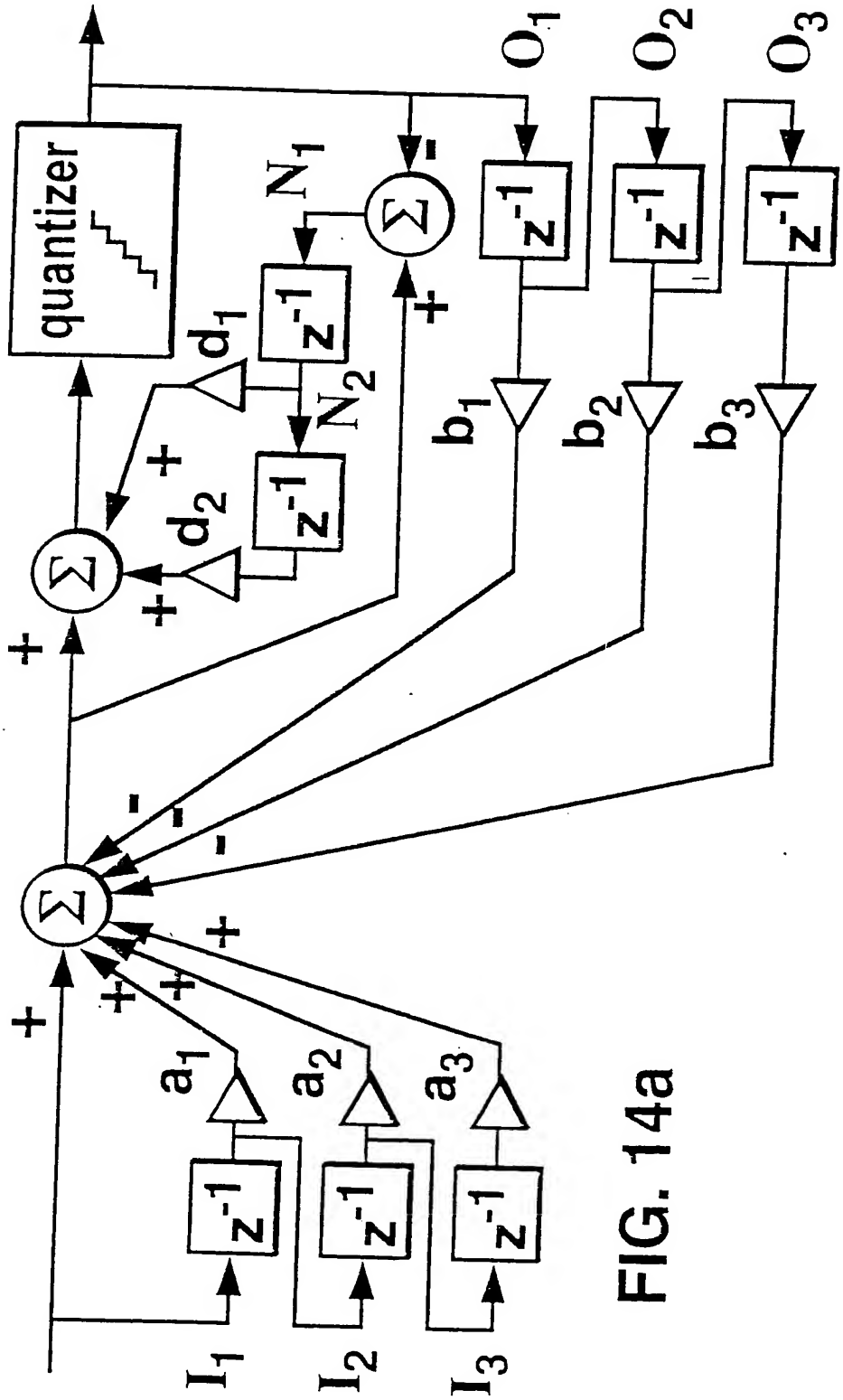


FIG. 14a

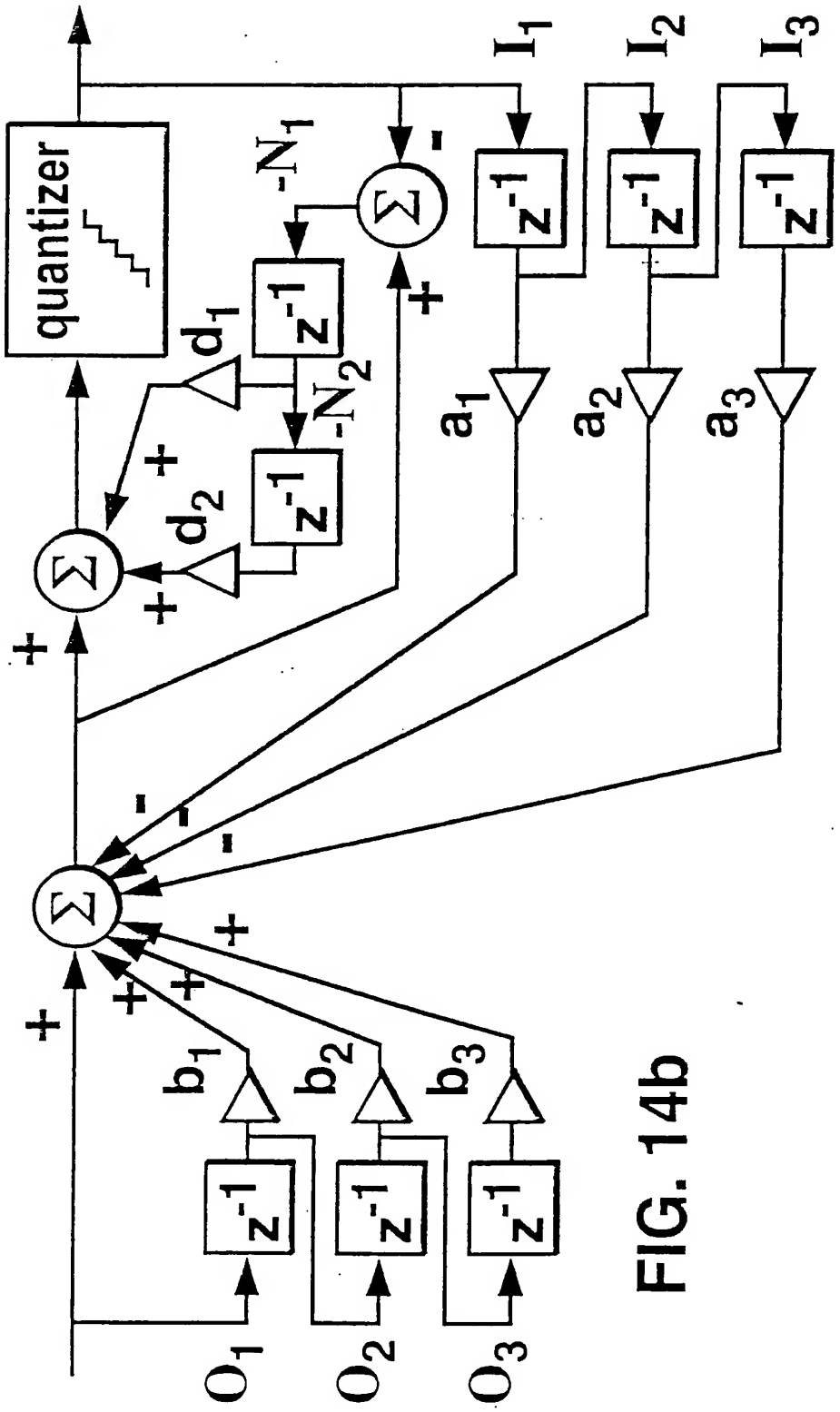


FIG. 14b

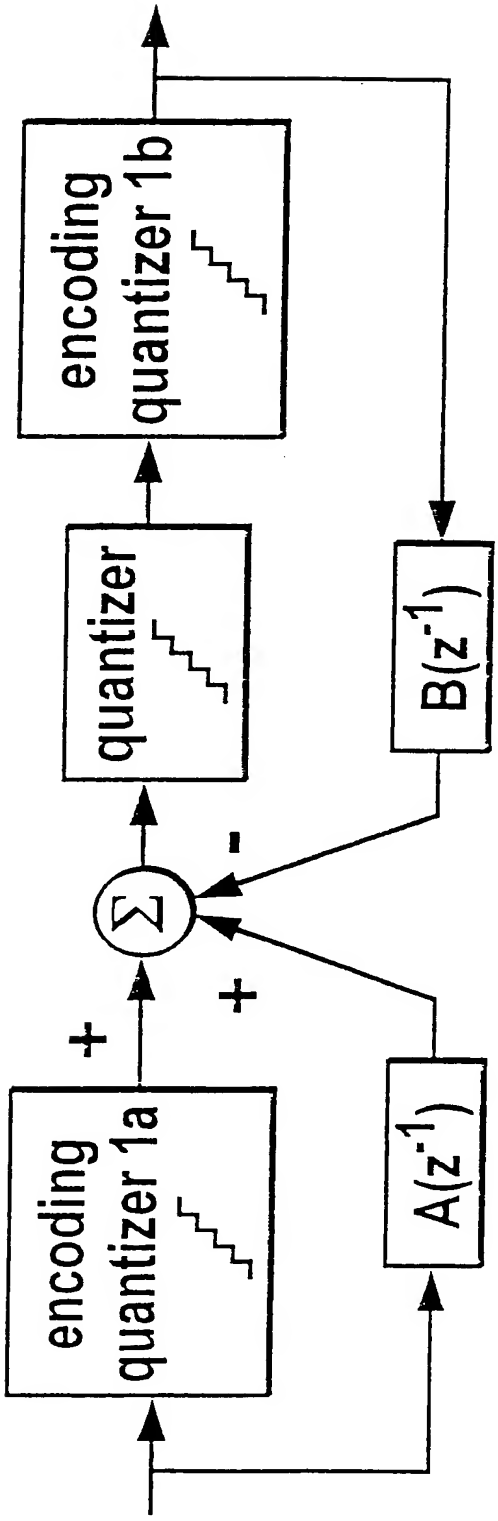


FIG. 15a

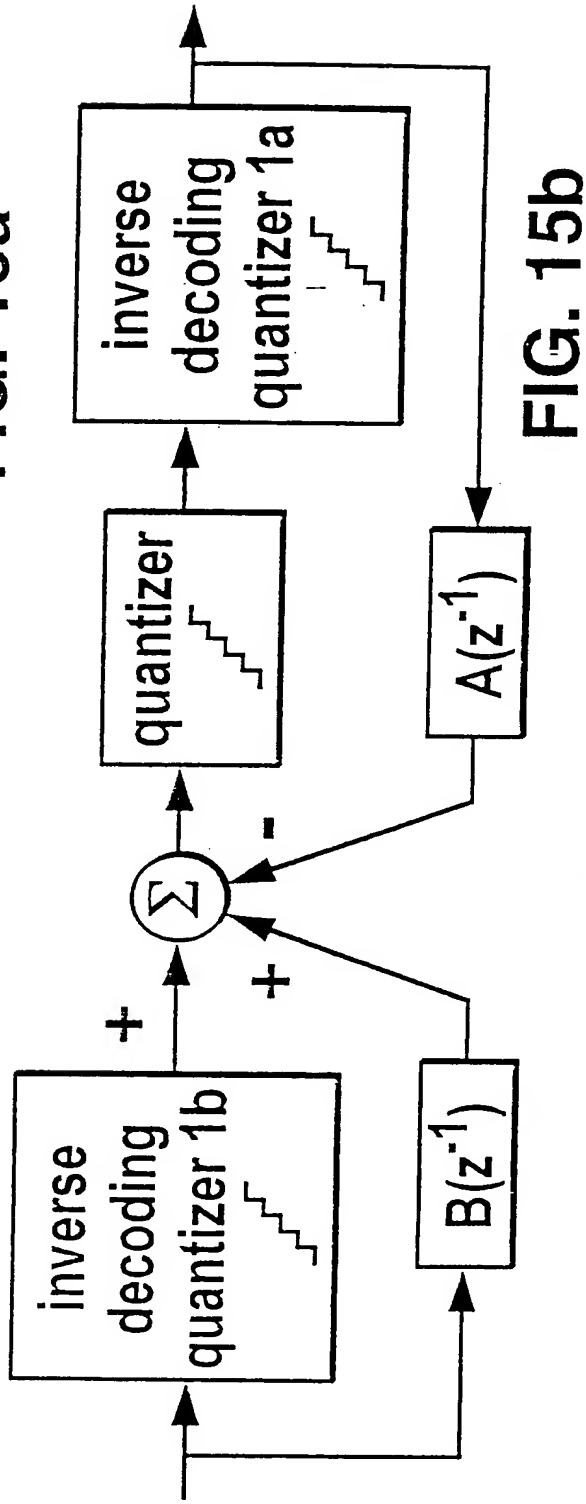


FIG. 15b

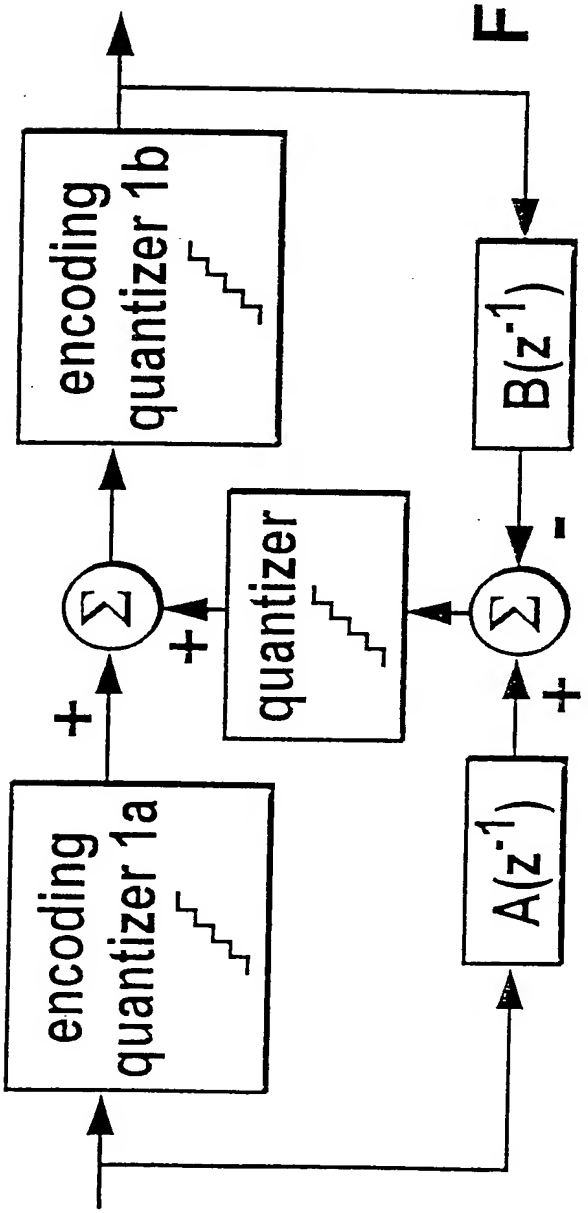


FIG. 15c

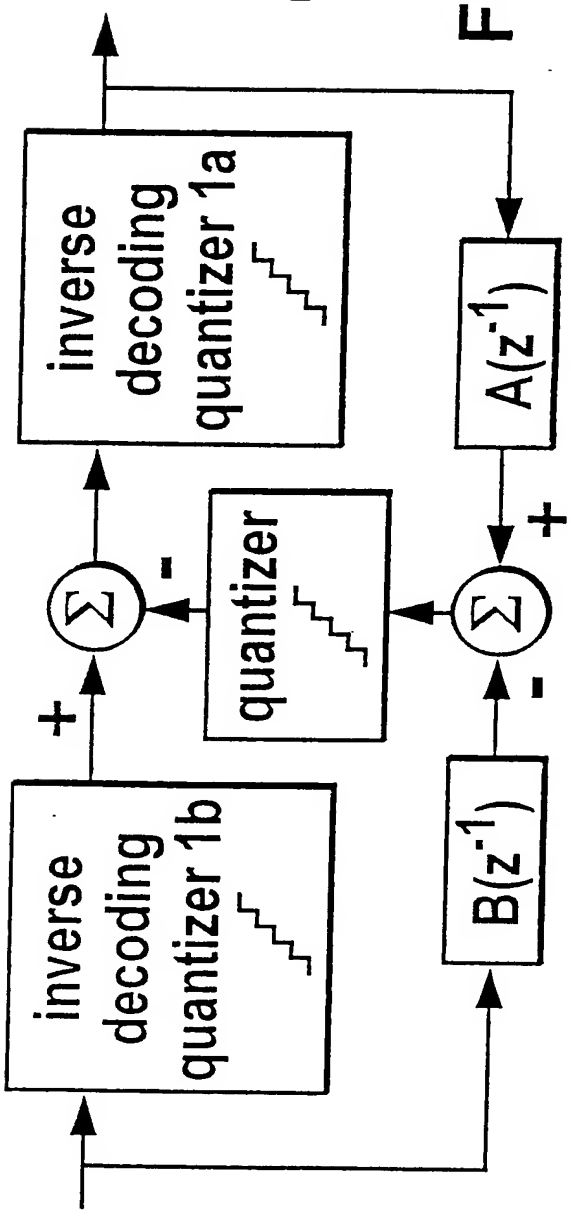


FIG. 15d

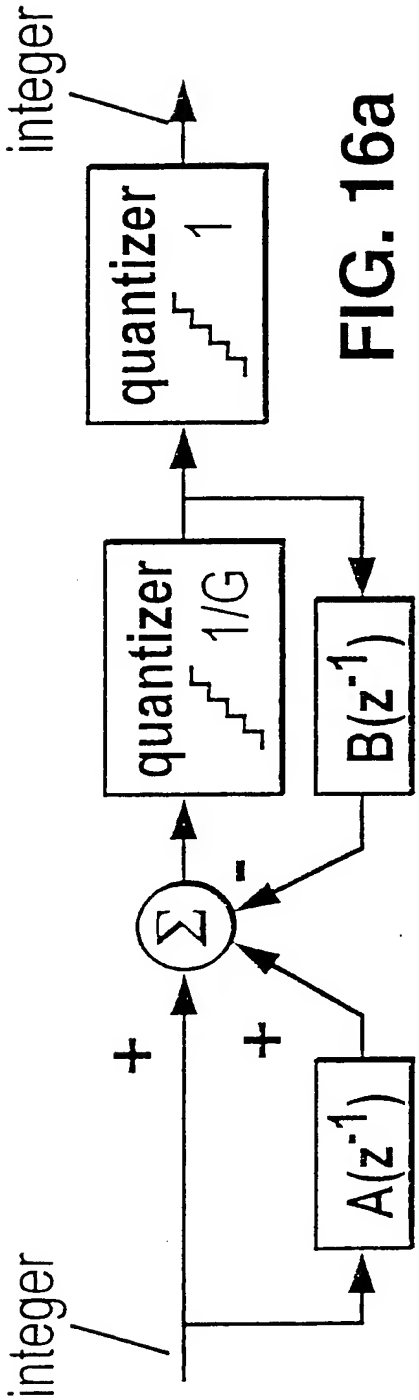


FIG. 16a

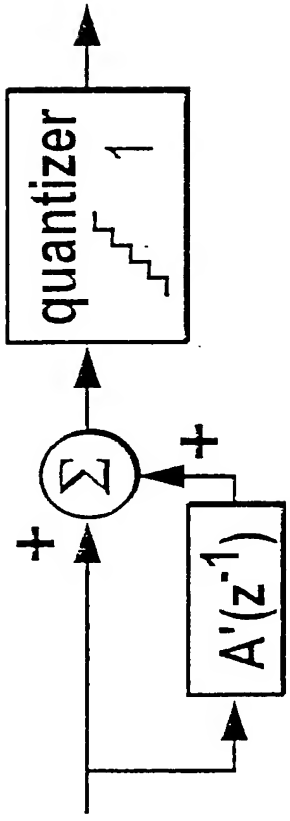


FIG. 16b

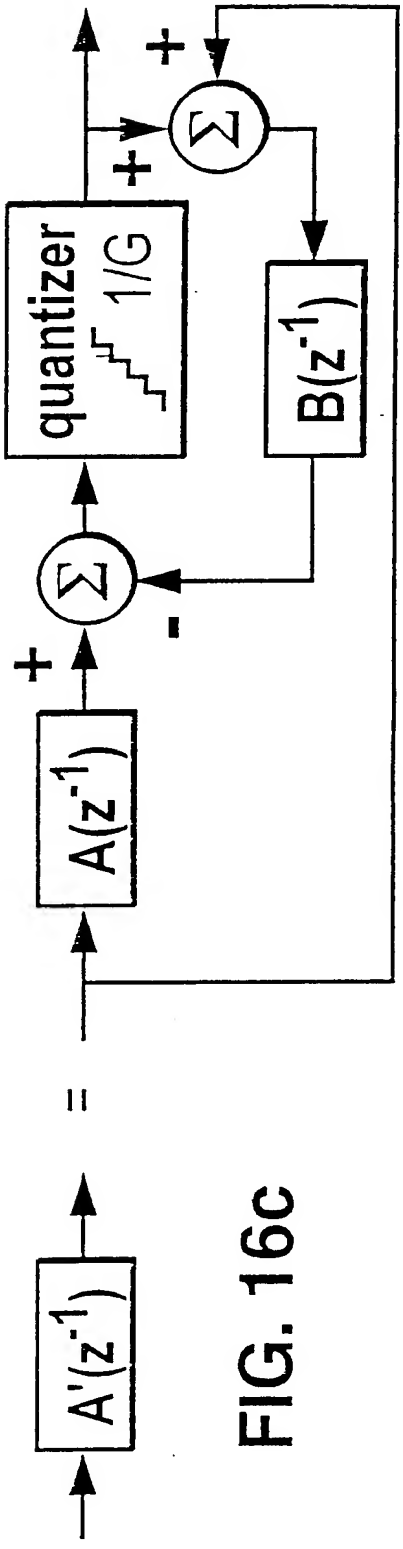


FIG. 16c

FIG. 16d

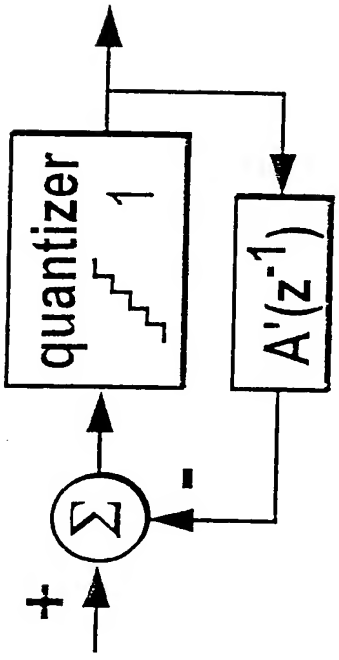
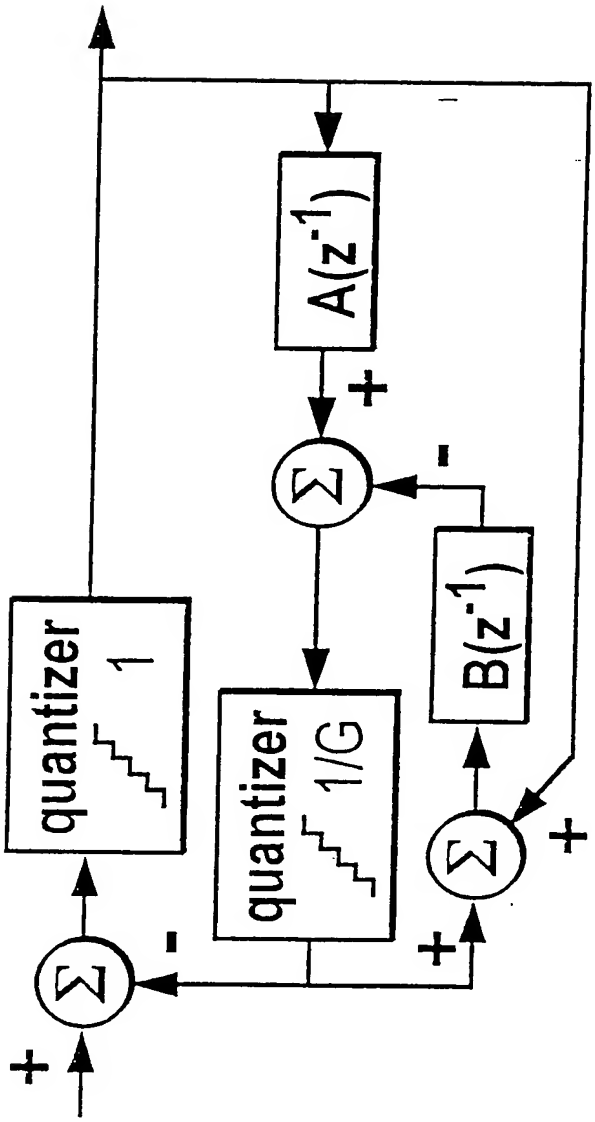


FIG. 16e



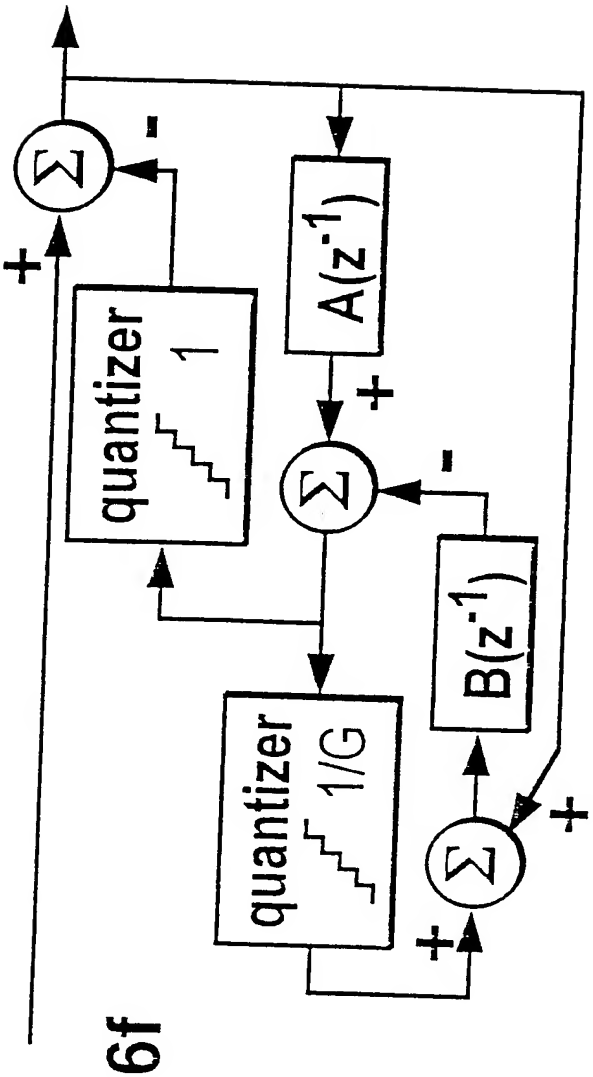


FIG. 16f

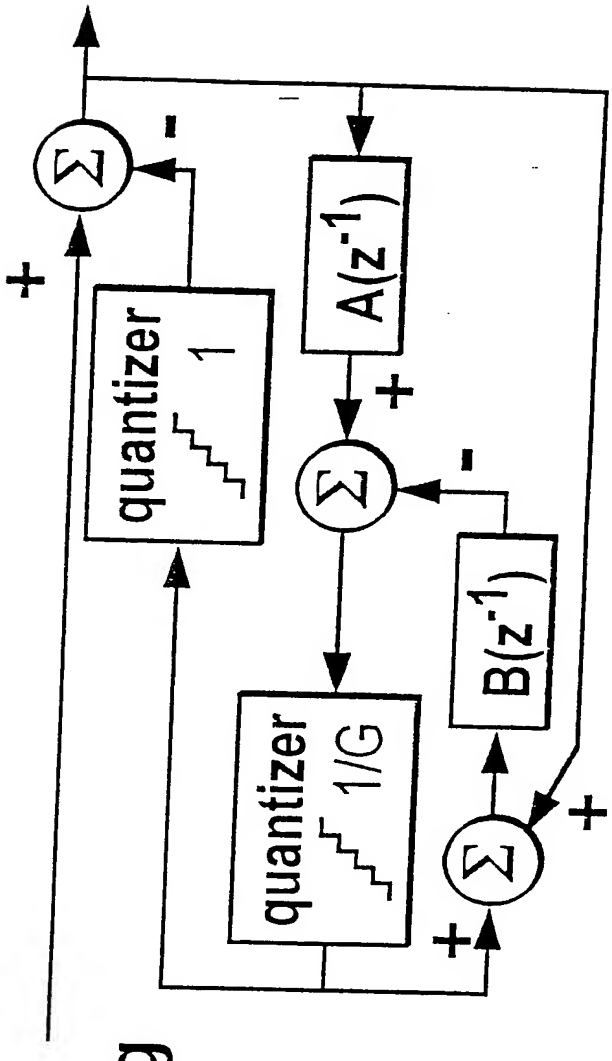


FIG. 16g

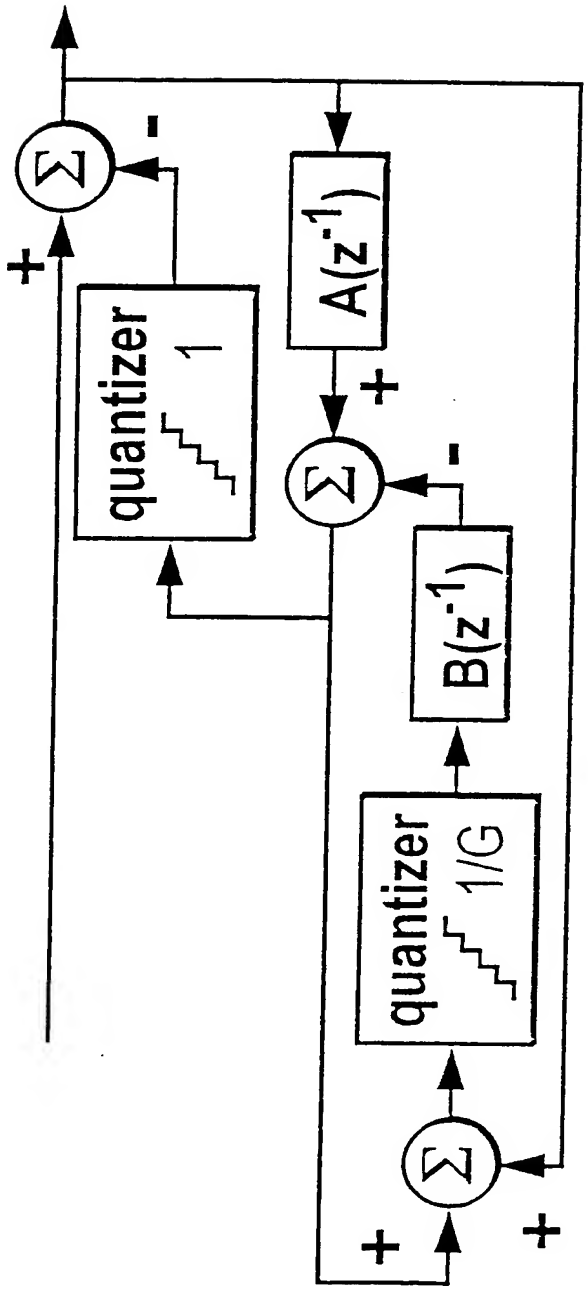


FIG. 16h

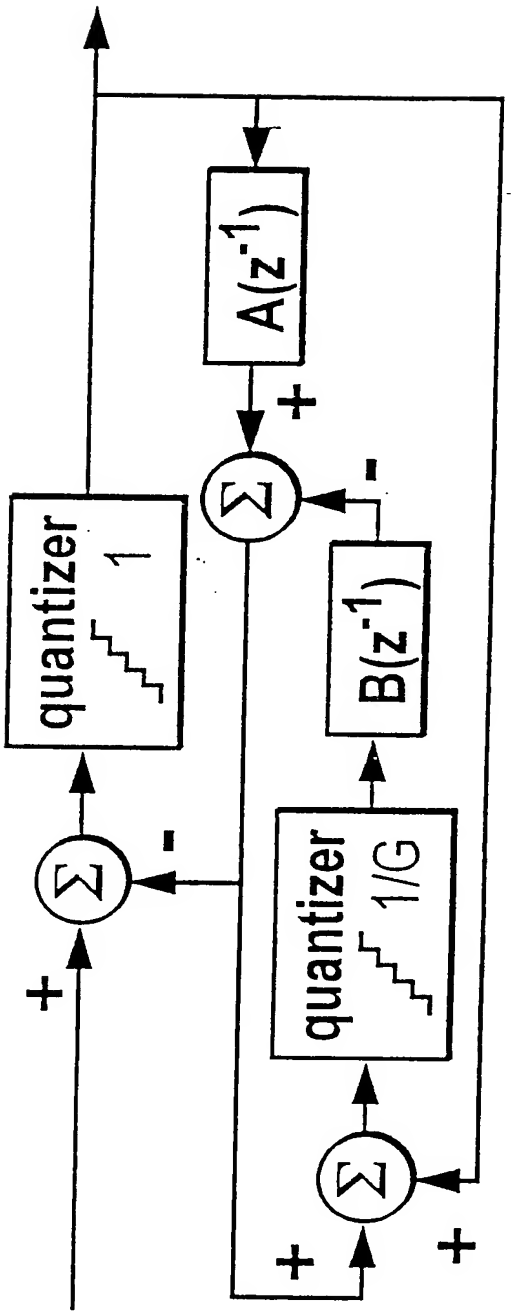


FIG. 16i

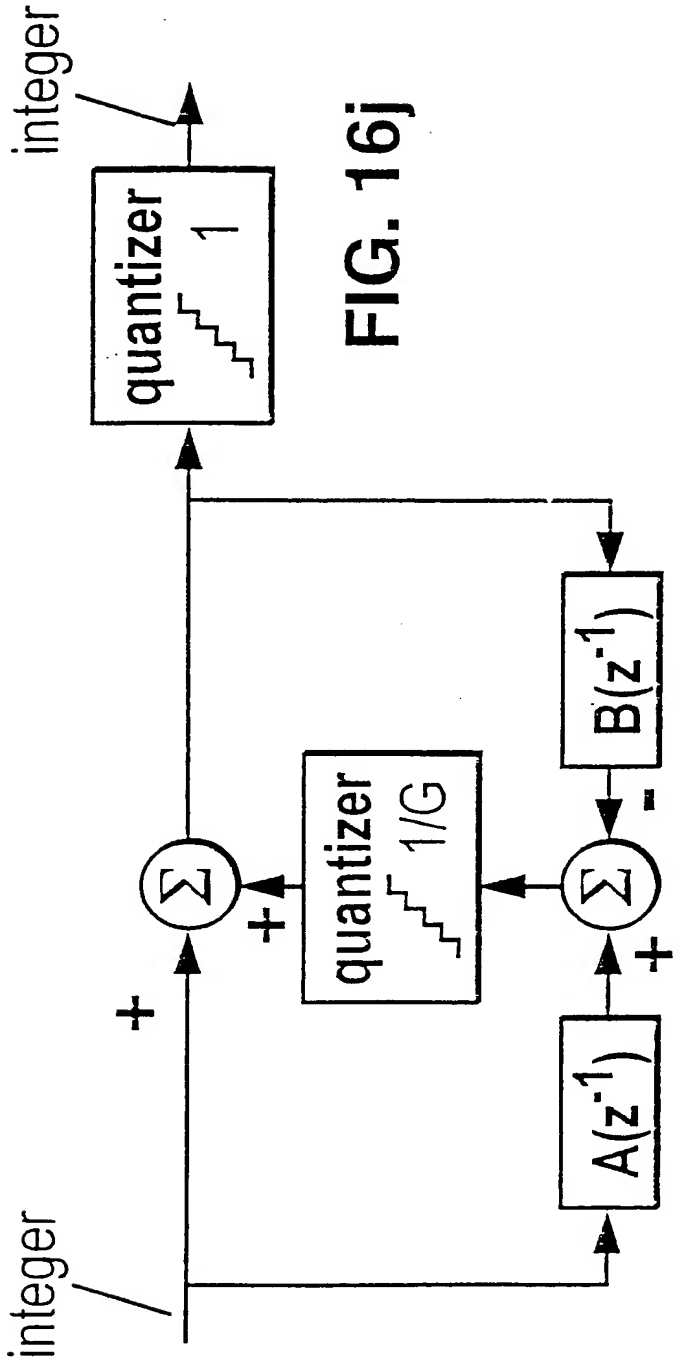


FIG. 16j

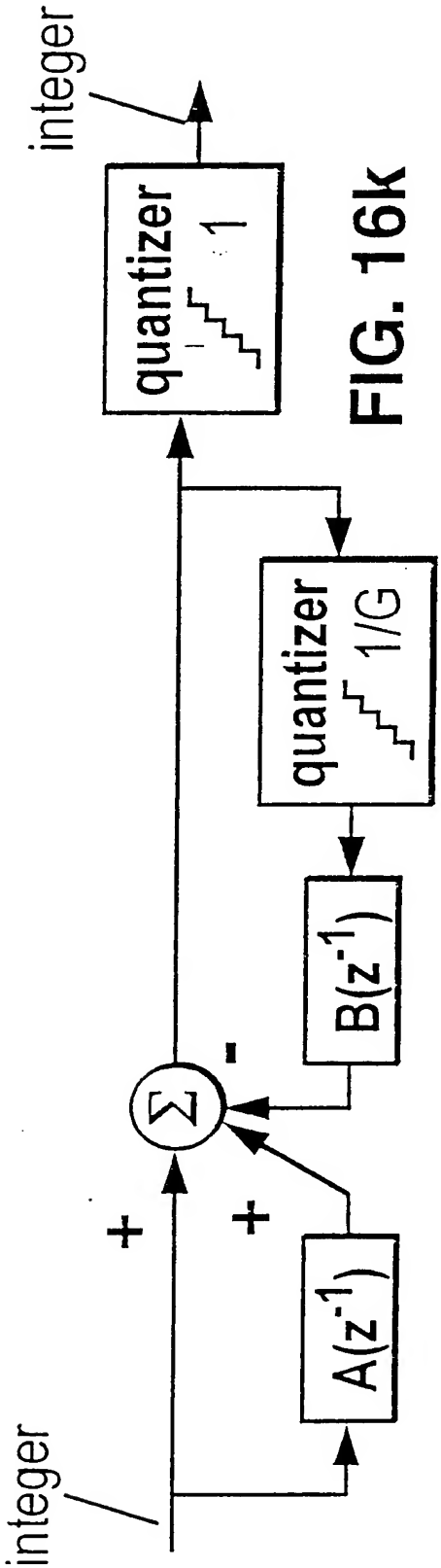


FIG. 16k

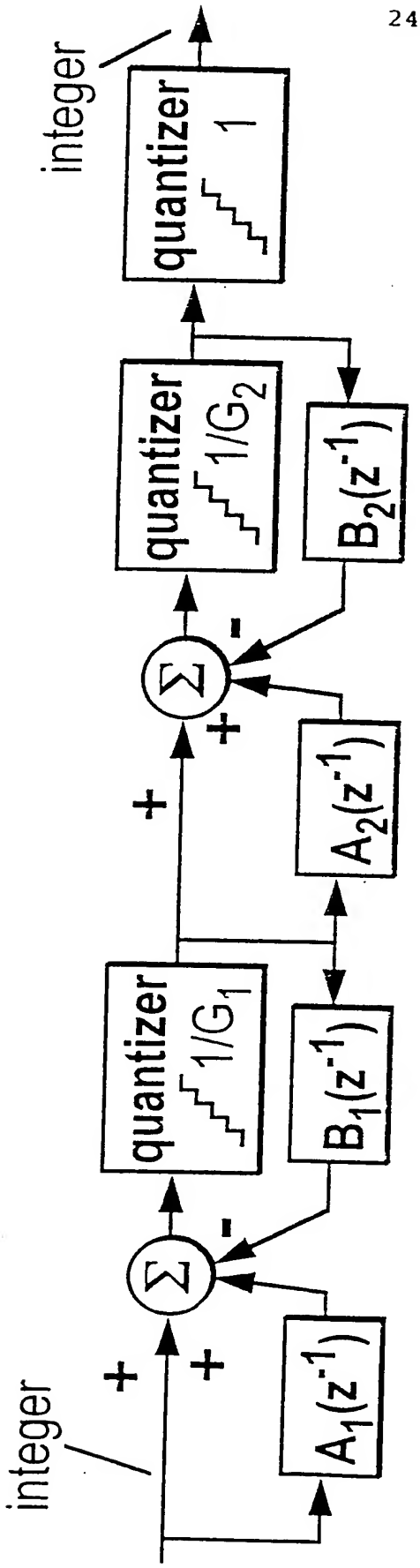


FIG. 17a

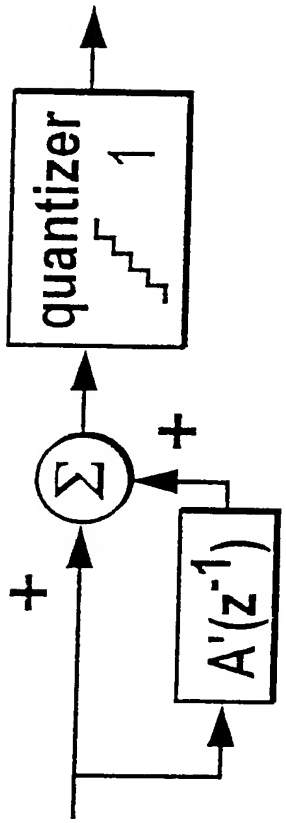


FIG. 17b

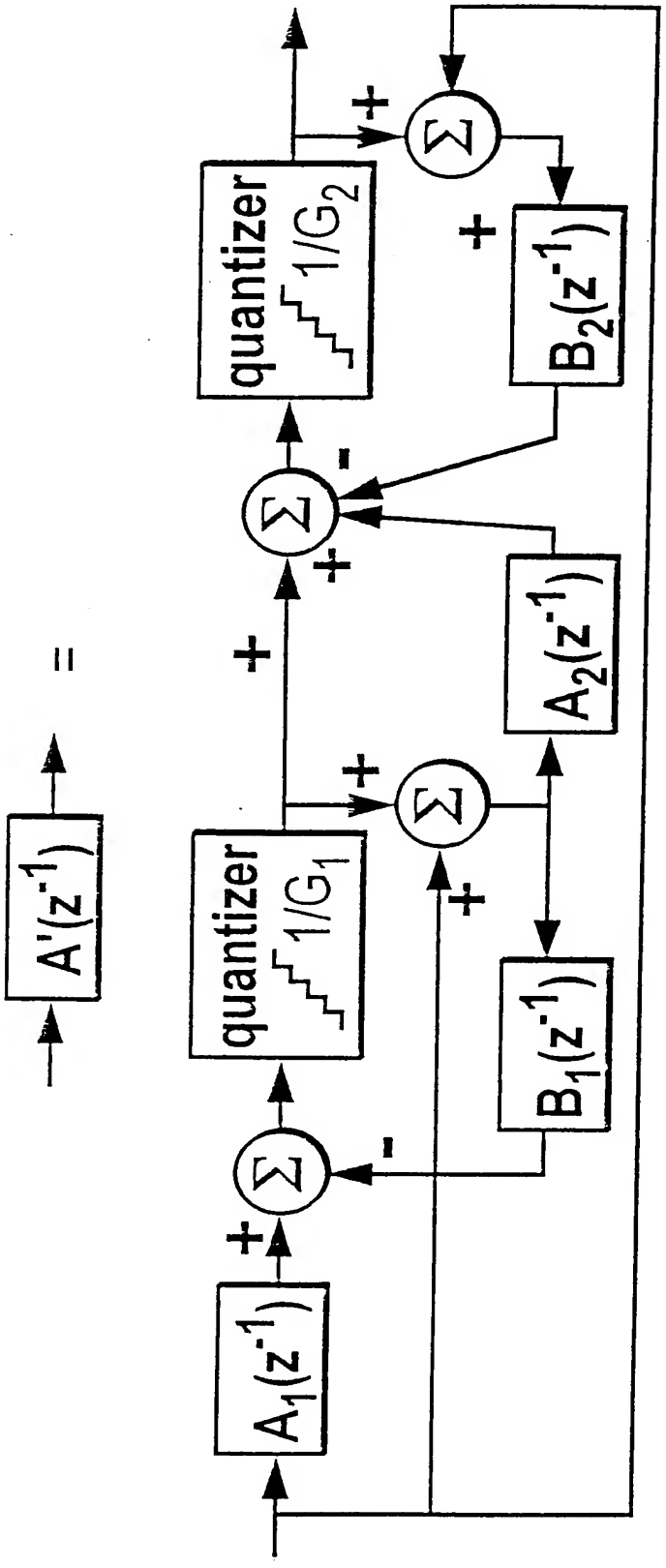


FIG. 17c

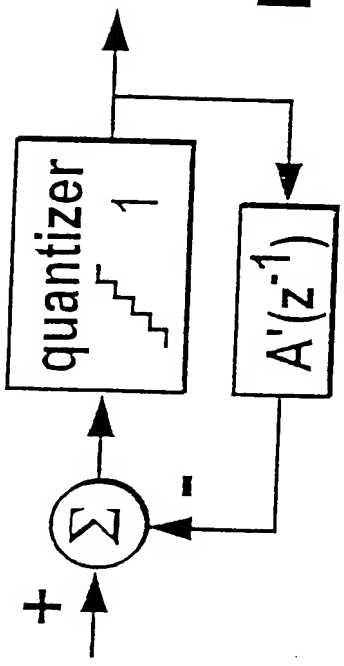


FIG. 17d

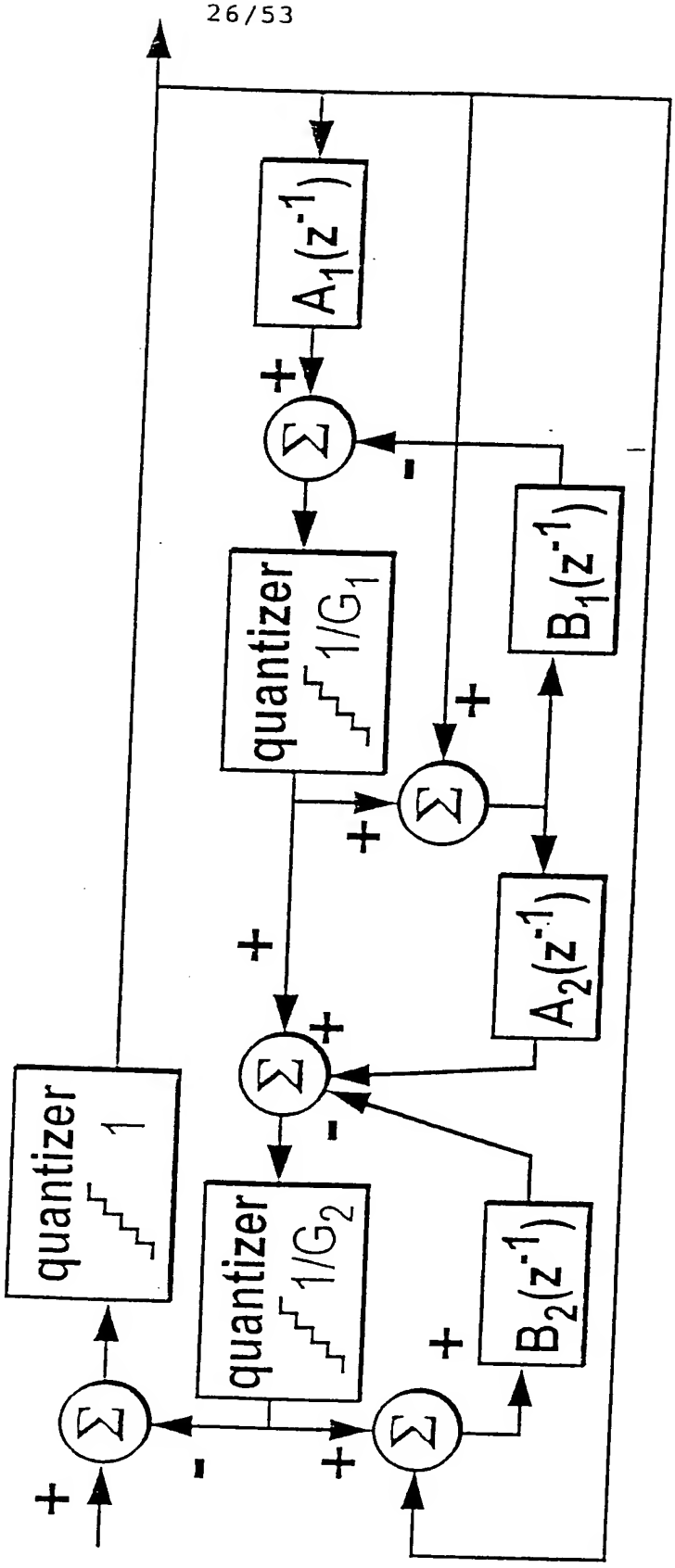


FIG. 17e

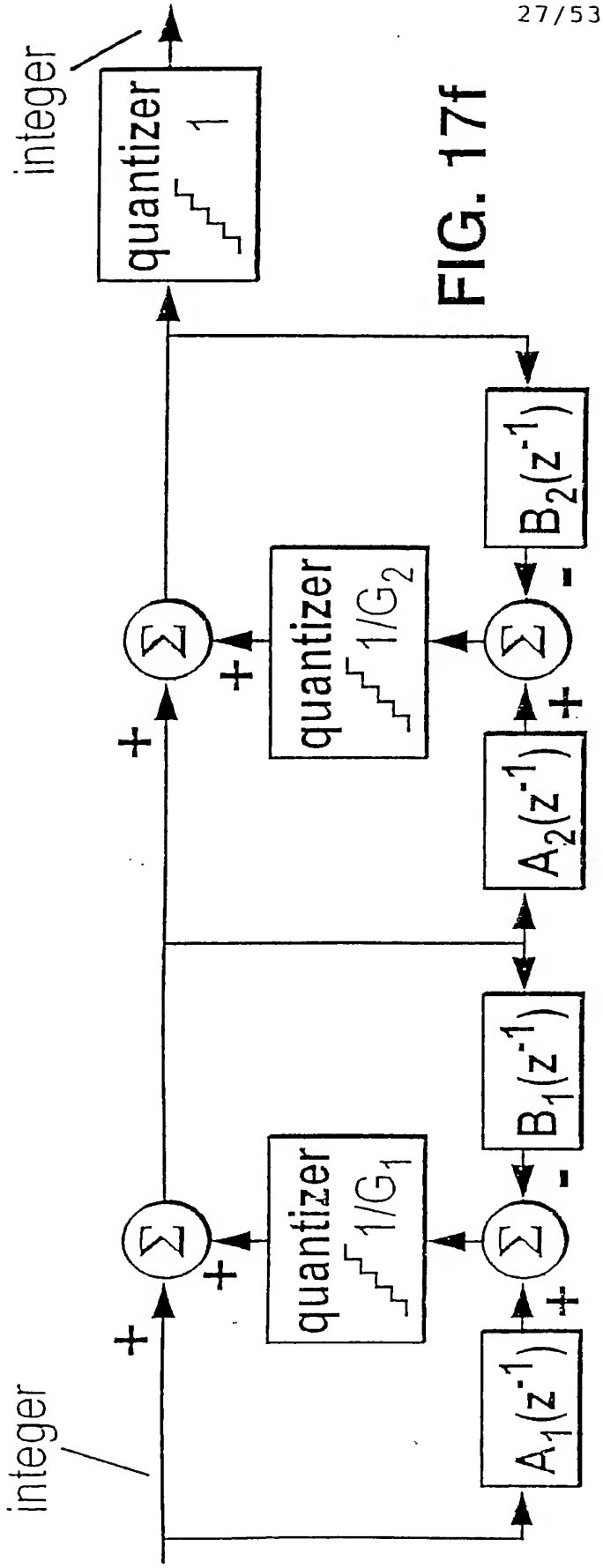


FIG. 17f

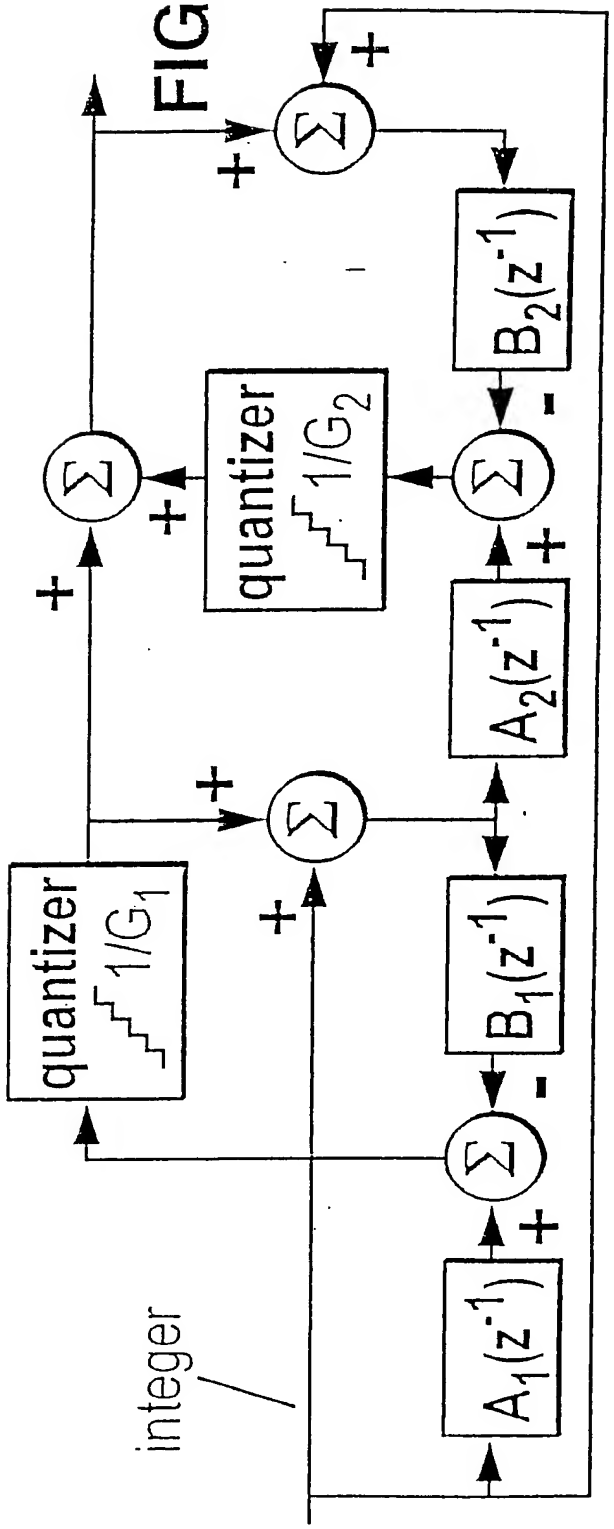


FIG. 17g

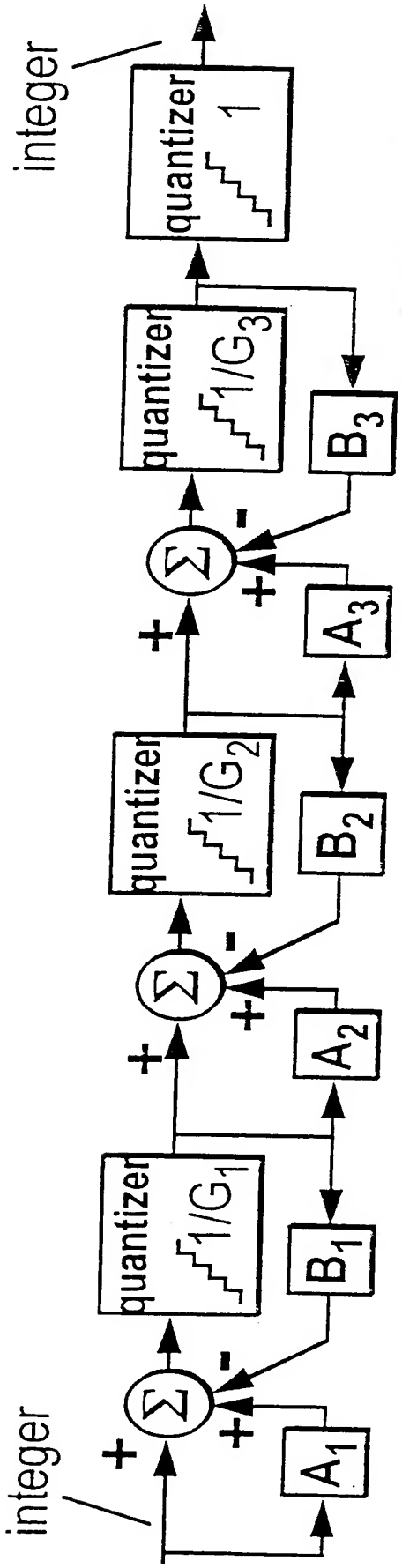


FIG. 17h

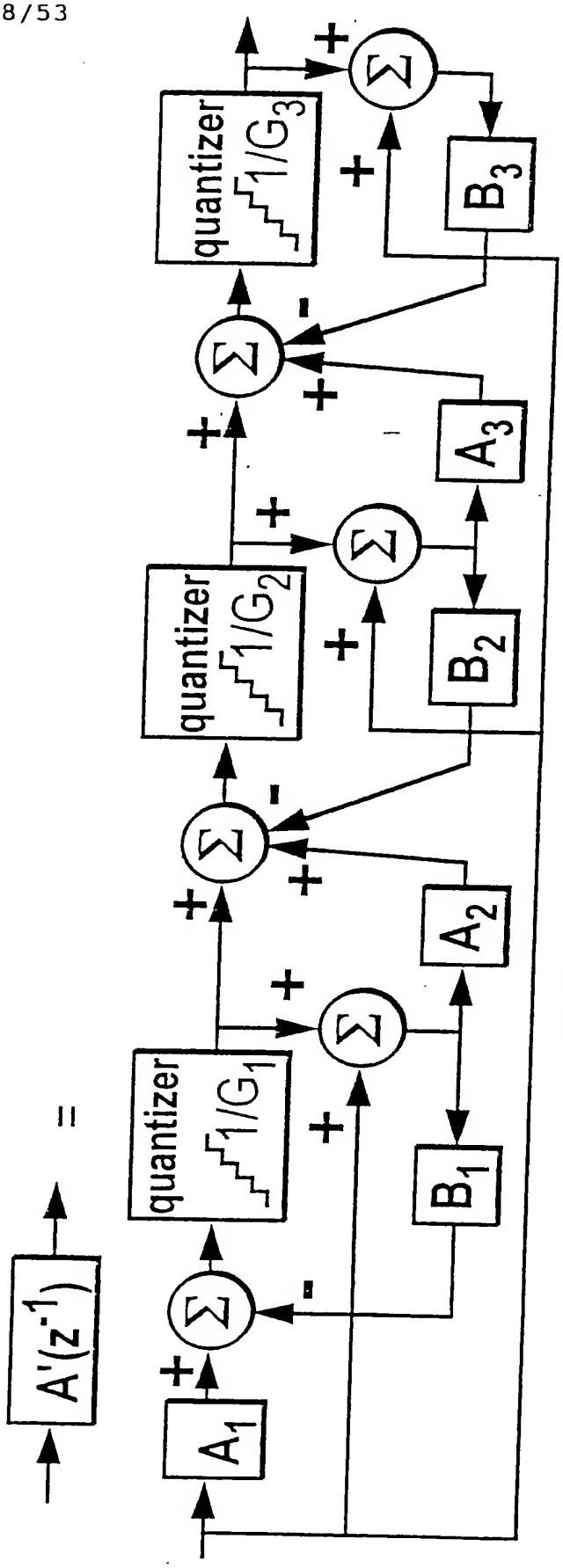


FIG. 17i

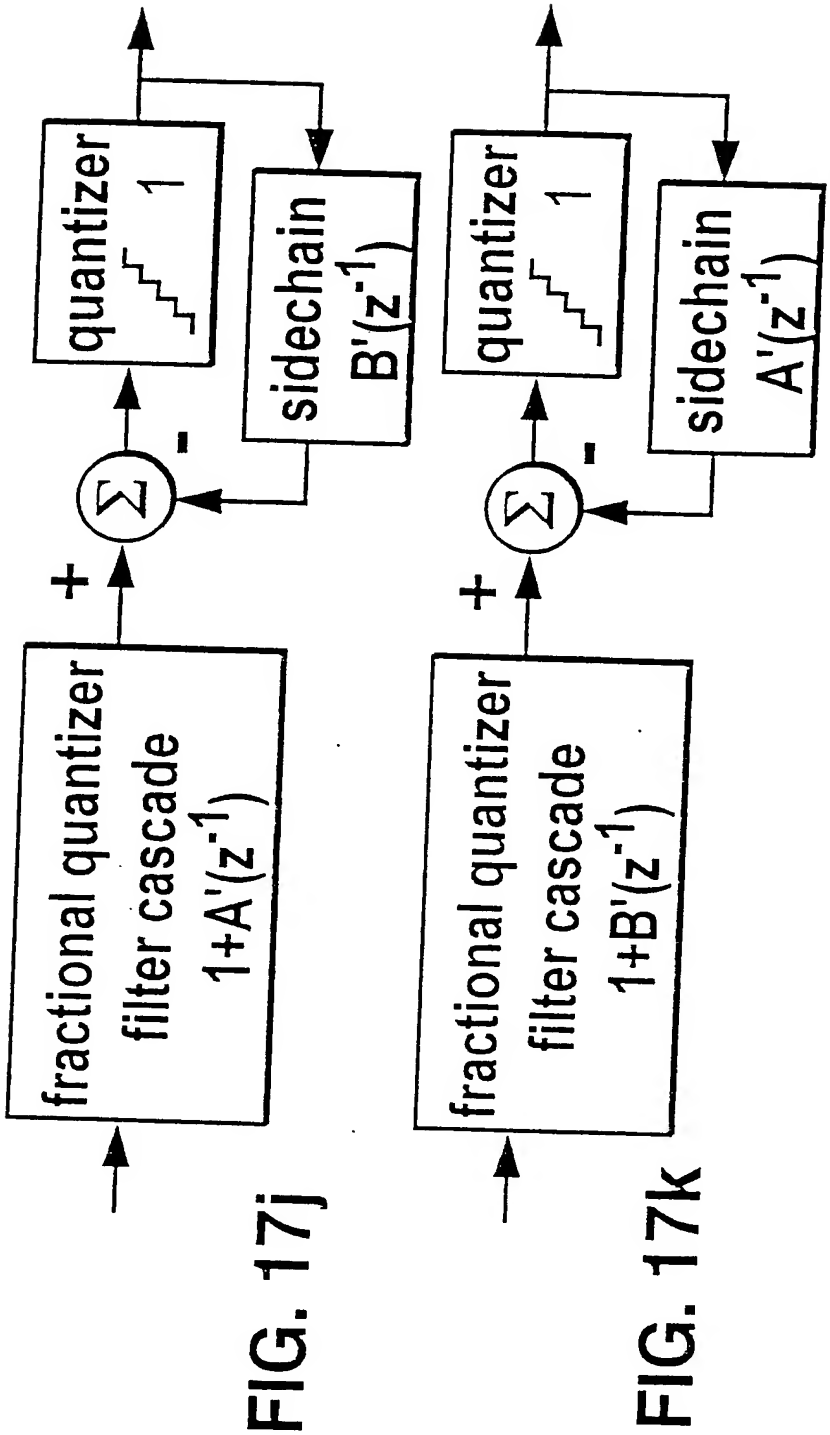


FIG. 17j

FIG. 17k

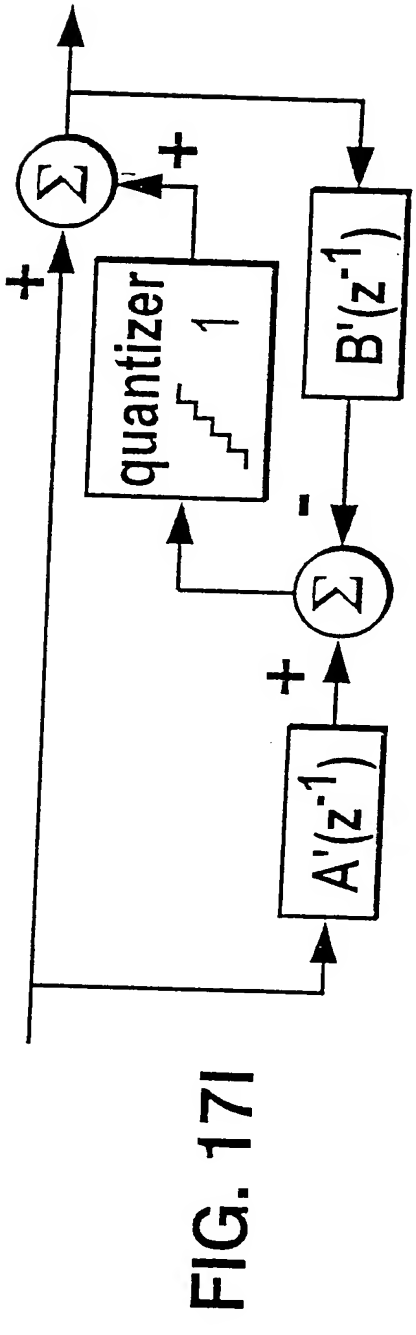


FIG. 17l

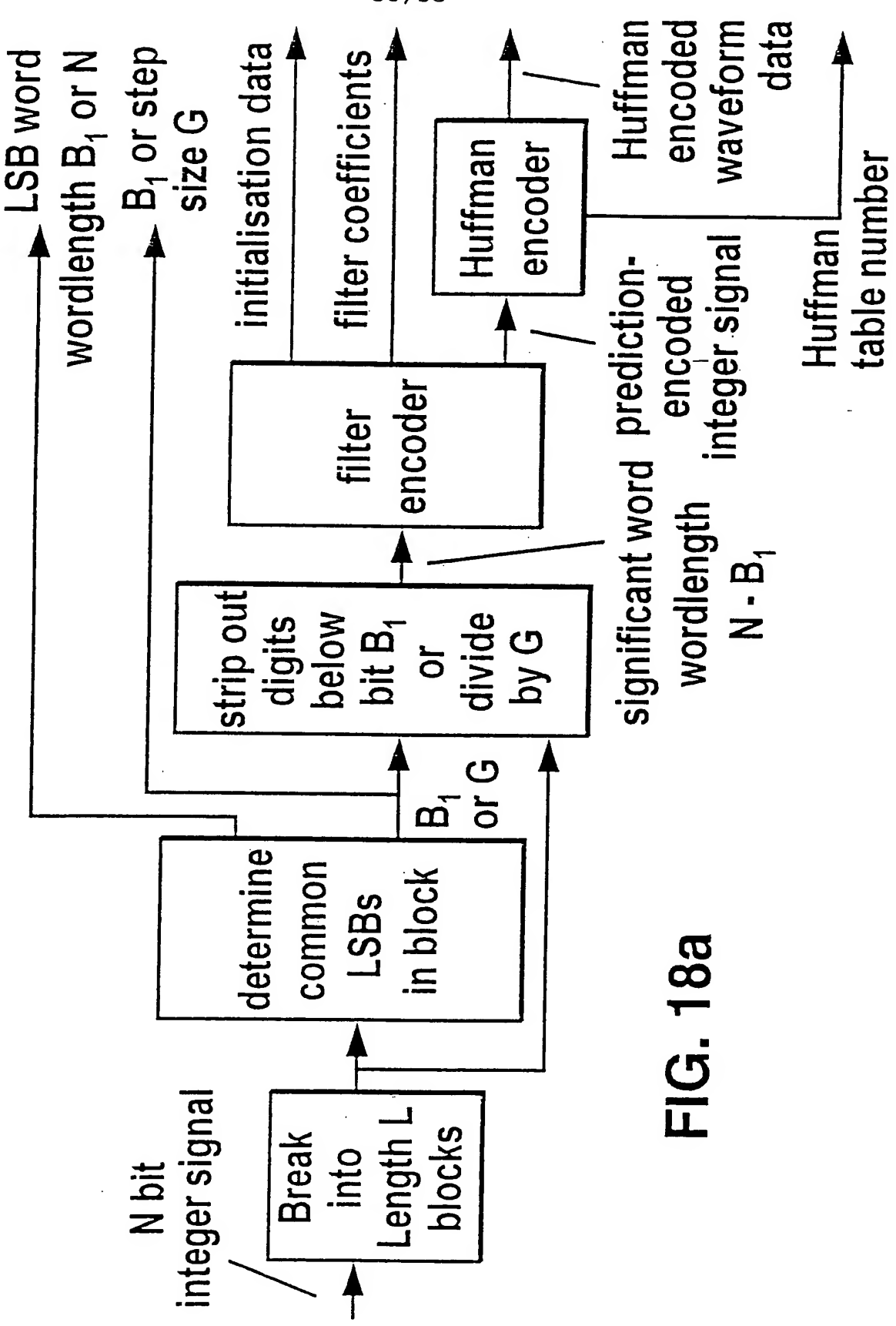

N bit integer signal
Break into Length L blocks
determine common LSBs in block
strip out digits below bit B_1 or divide by G
filter encoder
Huffman encoder
LSB word wordlength B_1 or N
B_1 or step size G
initialisation data
filter coefficients
significant word wordlength N - B_1
prediction-encoded integer signal
Huffman table number
Huffman encoded waveform data
B_1 or G

FIG. 18a

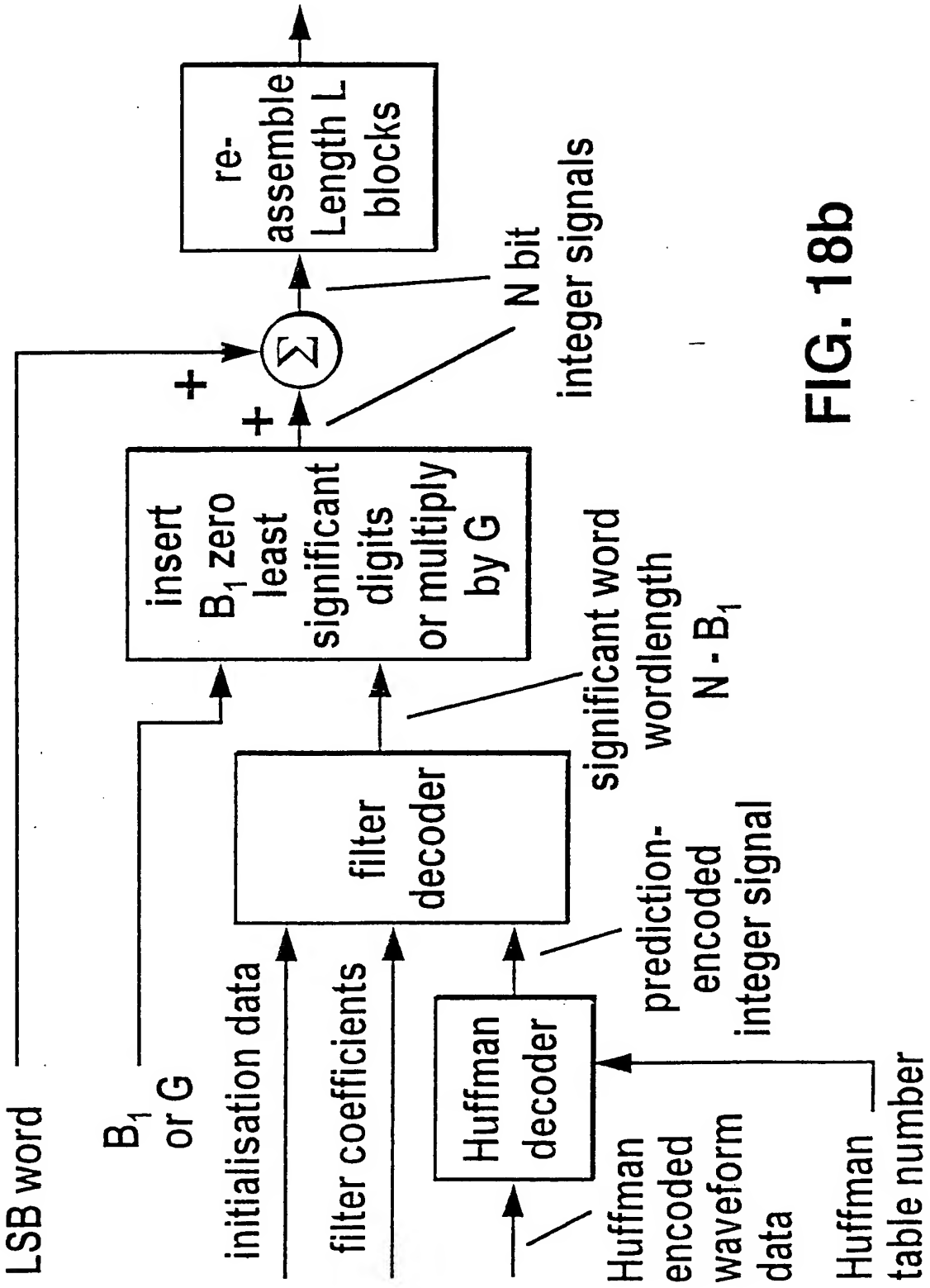
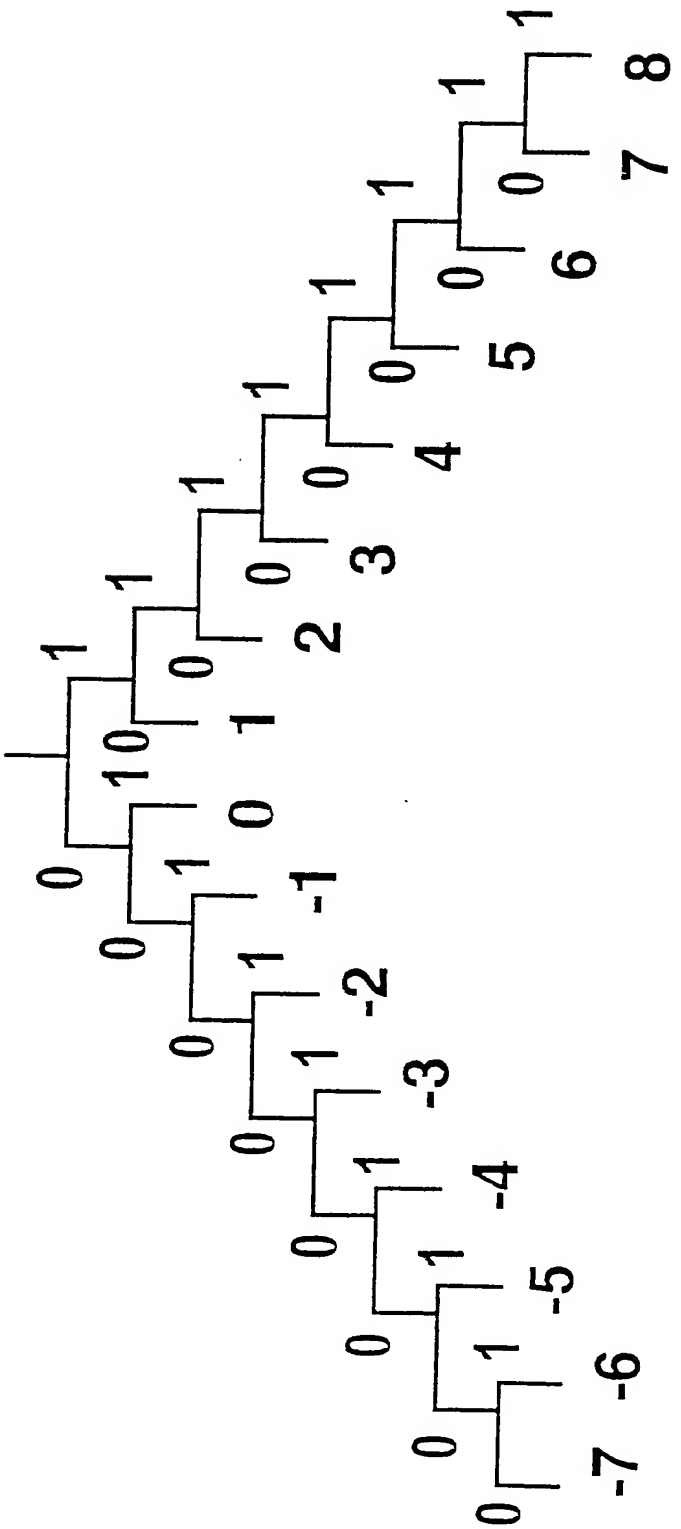

LSB word
B_1 or G
initialisation data
filter coefficients
Huffman encoded waveform data
Huffman table number
Huffman decoder
filter decoder
prediction-encoded integer signal
significant word wordlength N - B_1
insert B_1 zero least significant digits or multiply by G
+
+
Σ
N bit integer signals
re-assemble Length L blocks

FIG. 18b


0
1
0
1
0
1

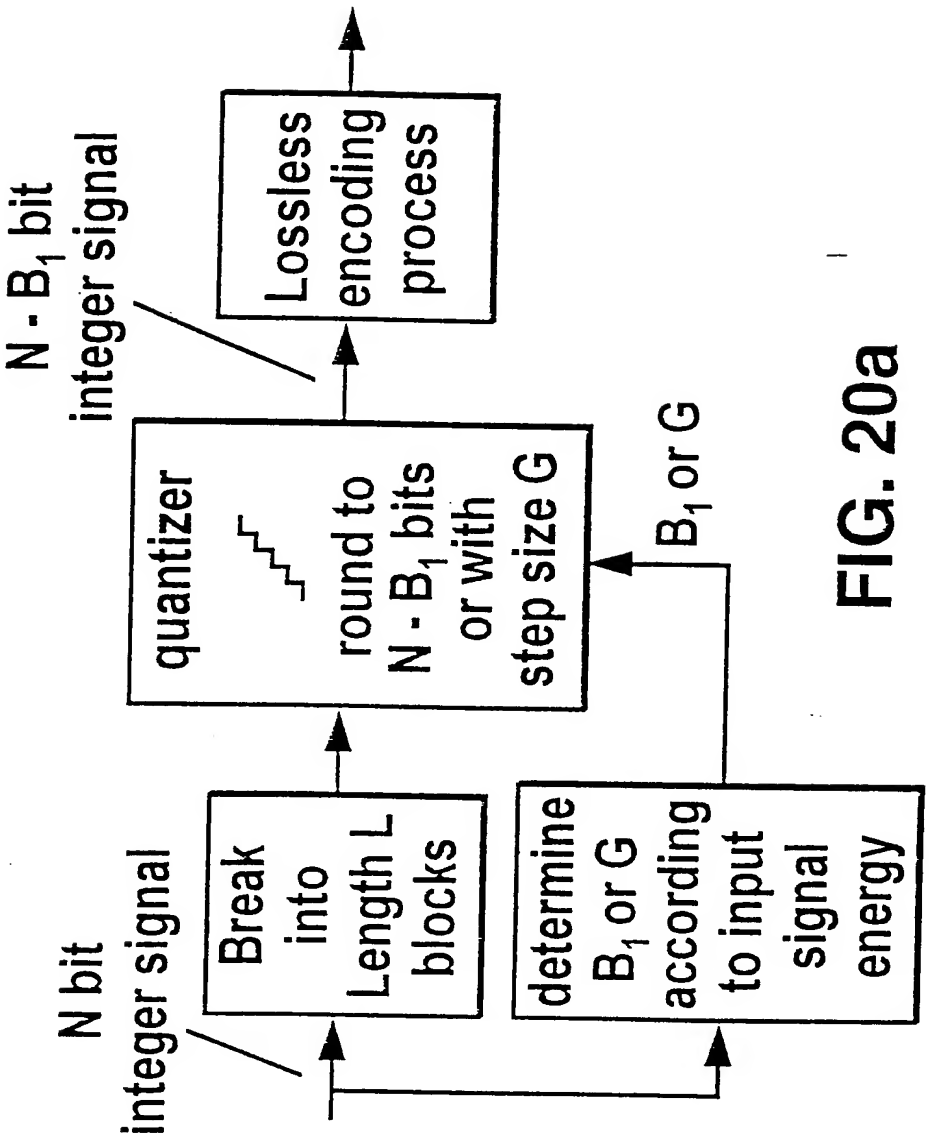

N bit integer signal
Break into Length L blocks
determine B_1 or G according to input signal energy
B_1 or G
quantizer
round to N - B_1 bits or with step size G
N - B_1 bit integer signal
Lossless encoding process

FIG. 20a

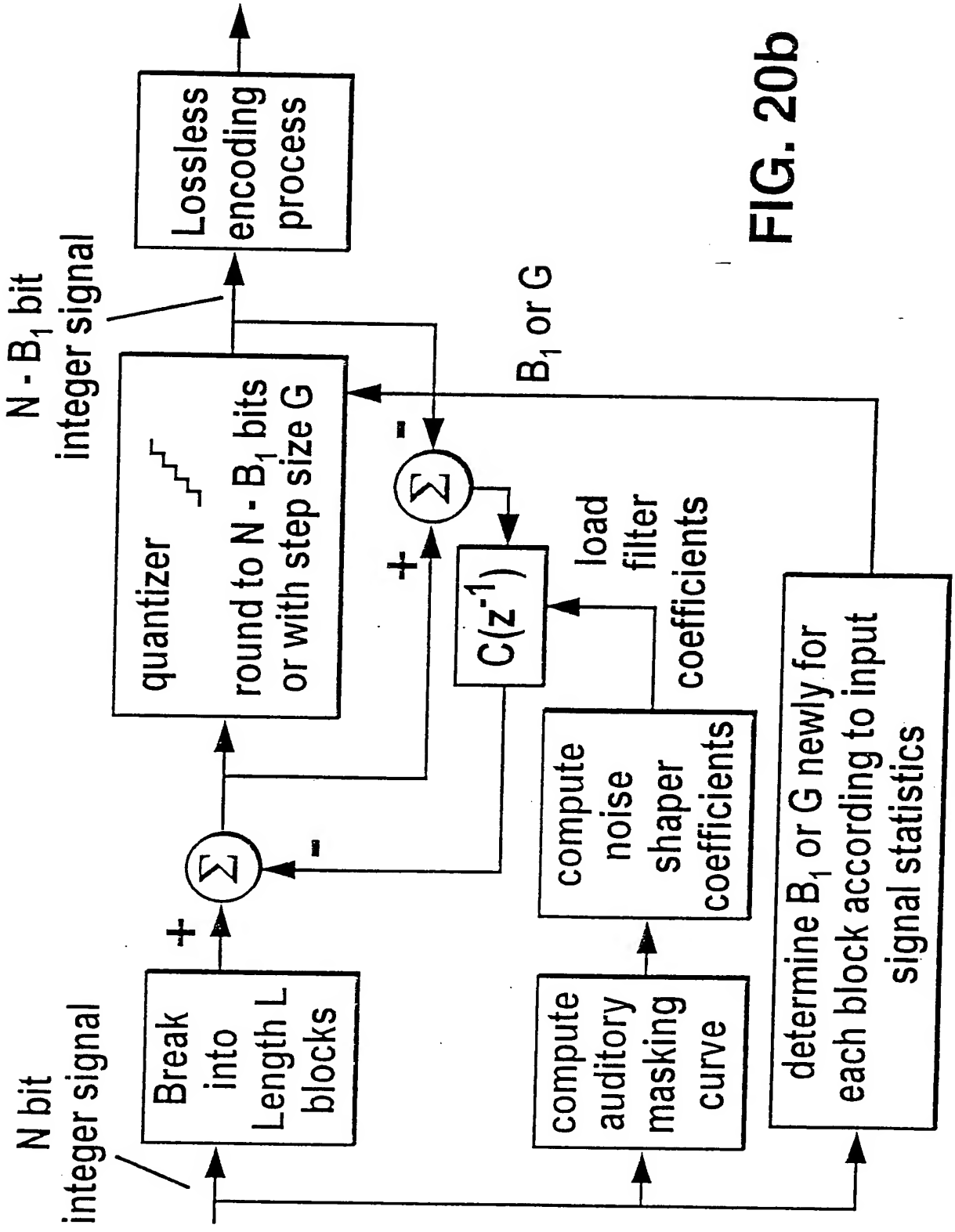

N bit integer signal
Break into Length L blocks
+
Σ
-
quantizer
round to N - B1 bits or with step size G
N - B1 bit integer signal
Lossless encoding process
B1 or G
+
Σ
-
C(z-1)
load filter coefficients
compute noise shaper coefficients
compute auditory masking curve
determine B1 or G newly for each block according to input signal statistics

FIG. 20b

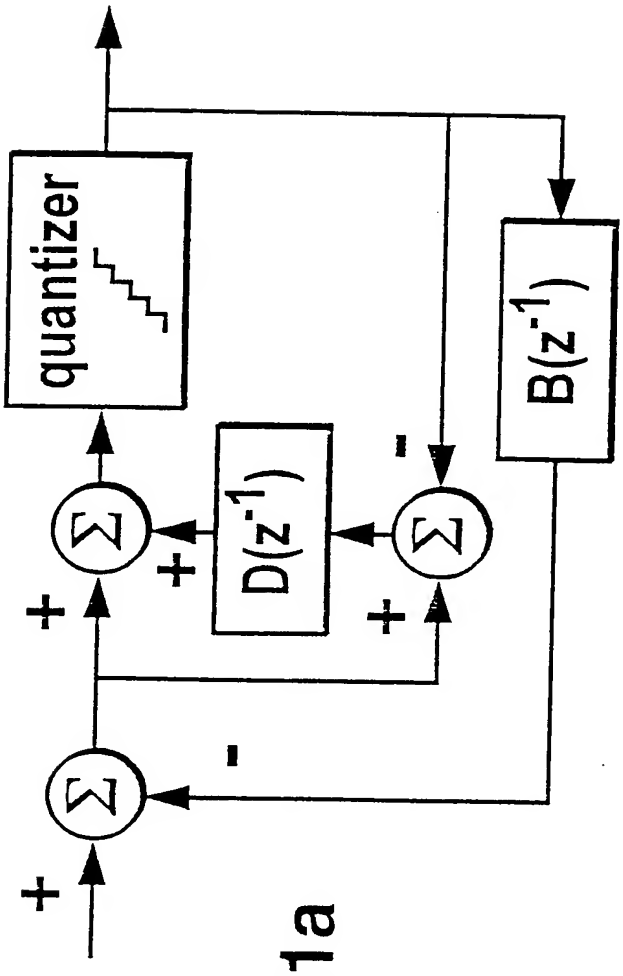


FIG. 21a

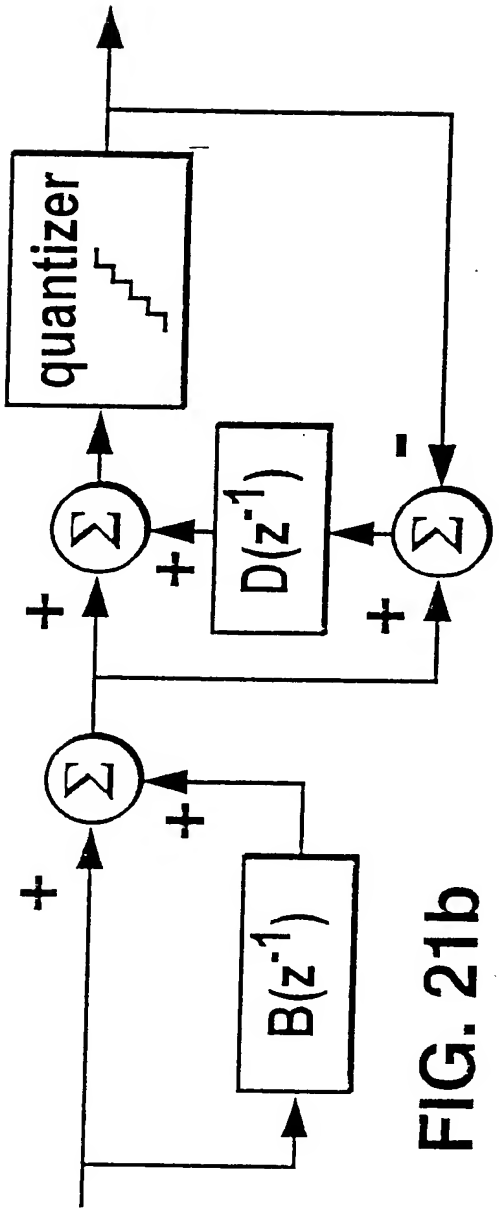


FIG. 21b

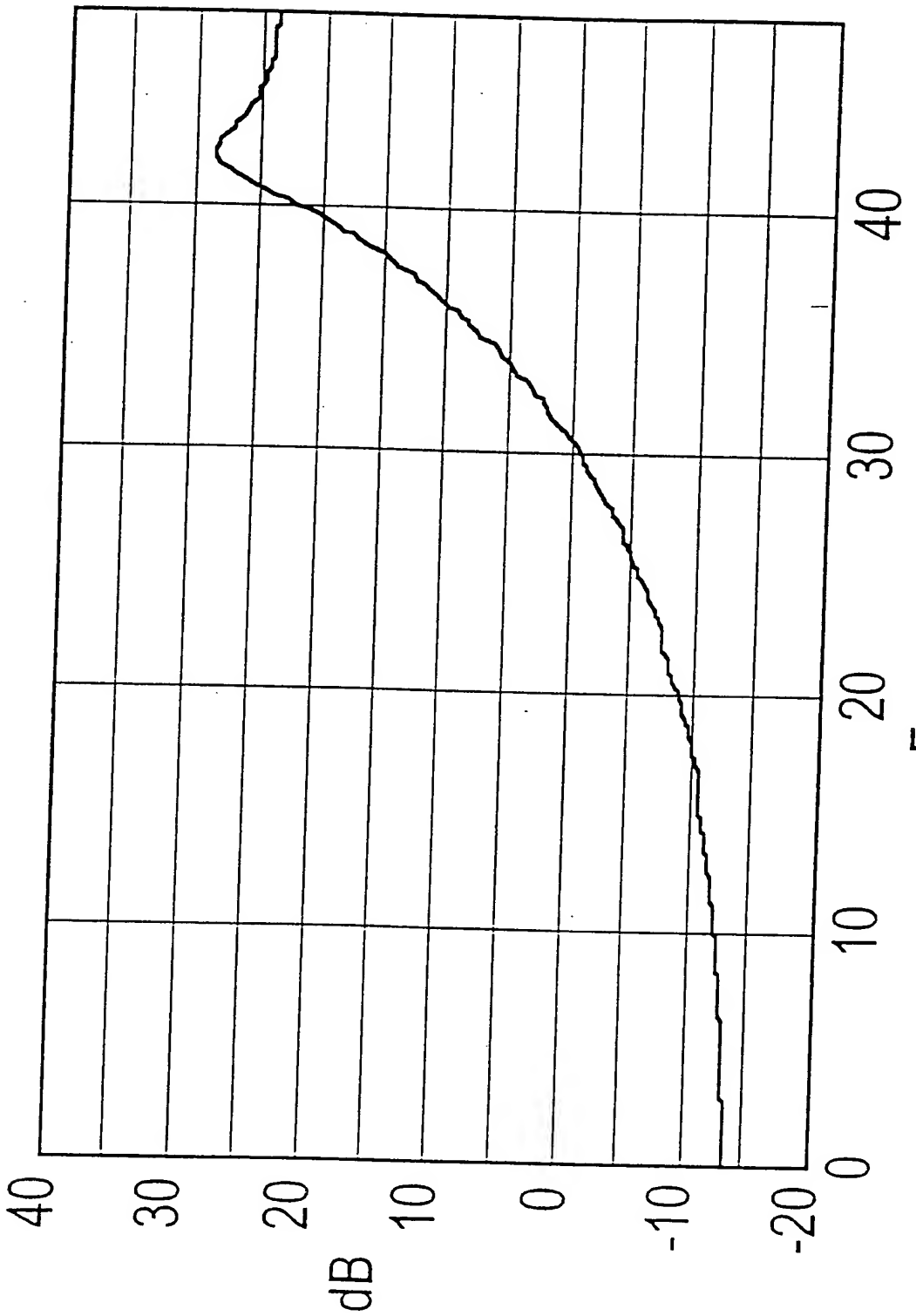


FIG. 21c

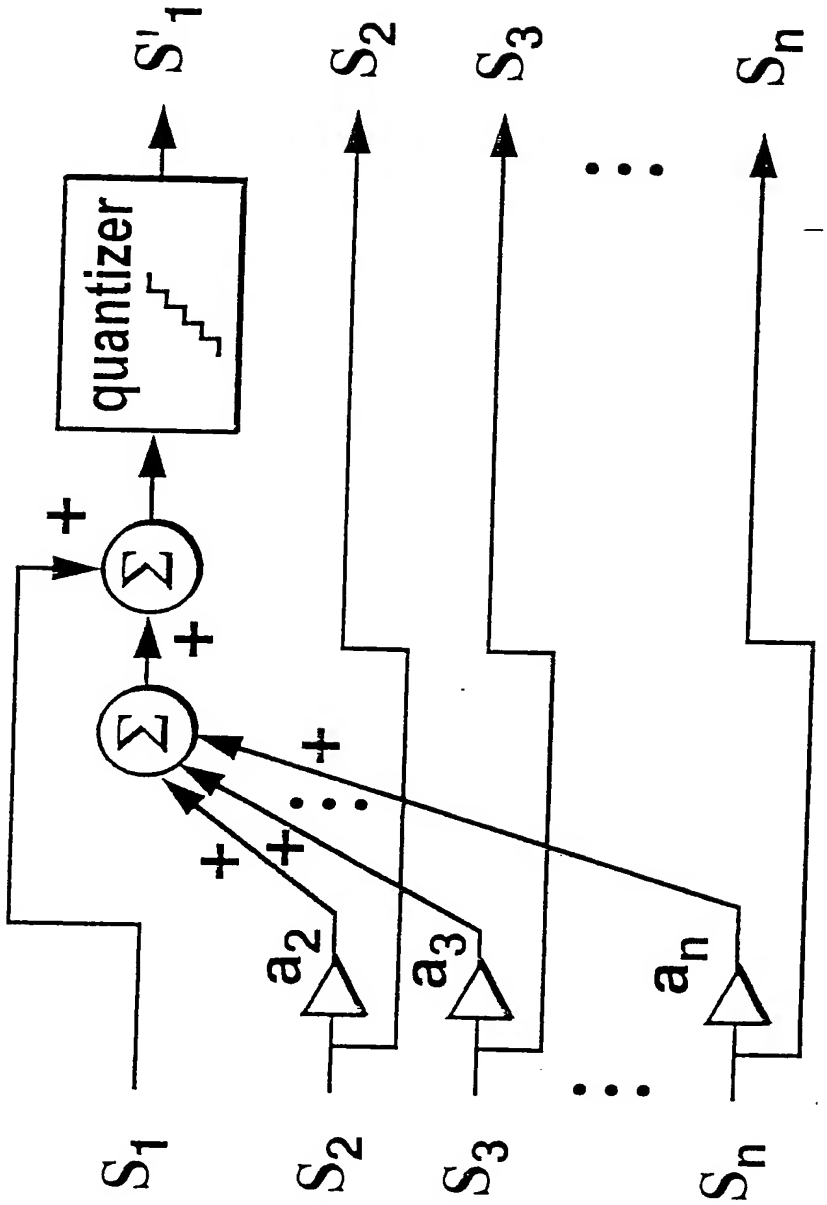


FIG. 22a

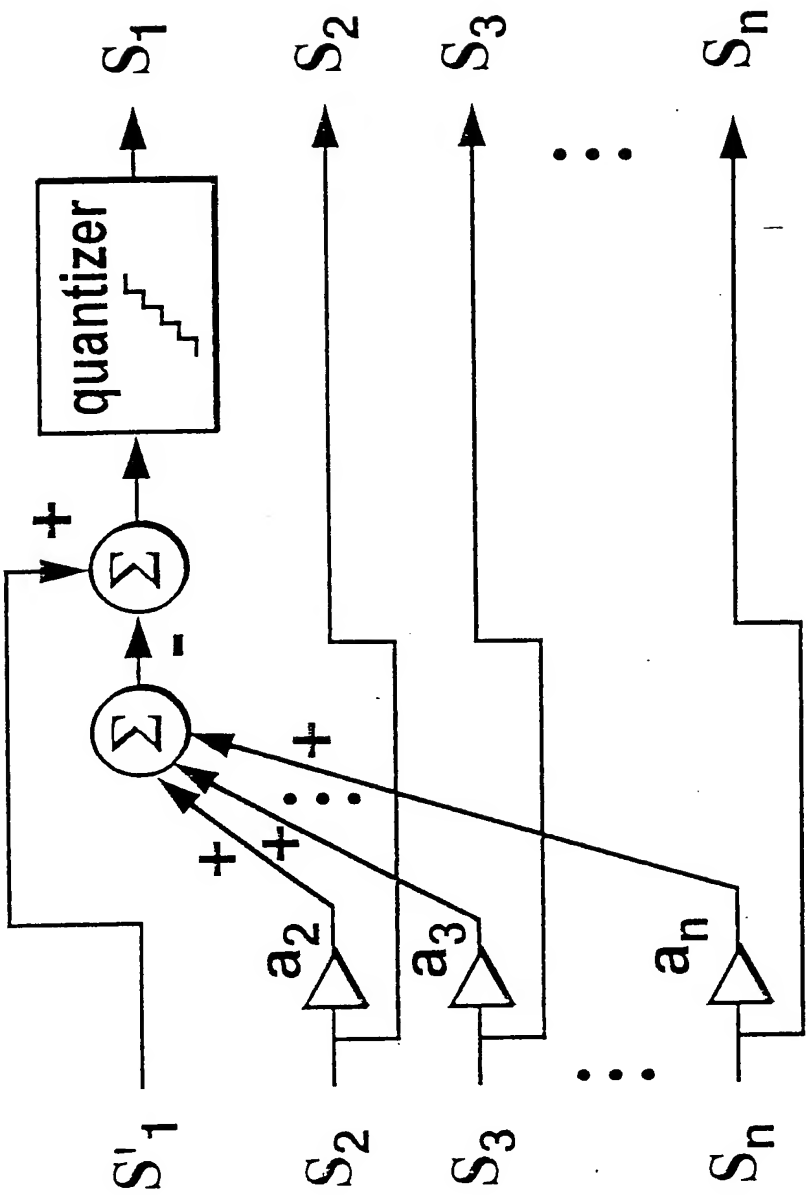


FIG. 22b

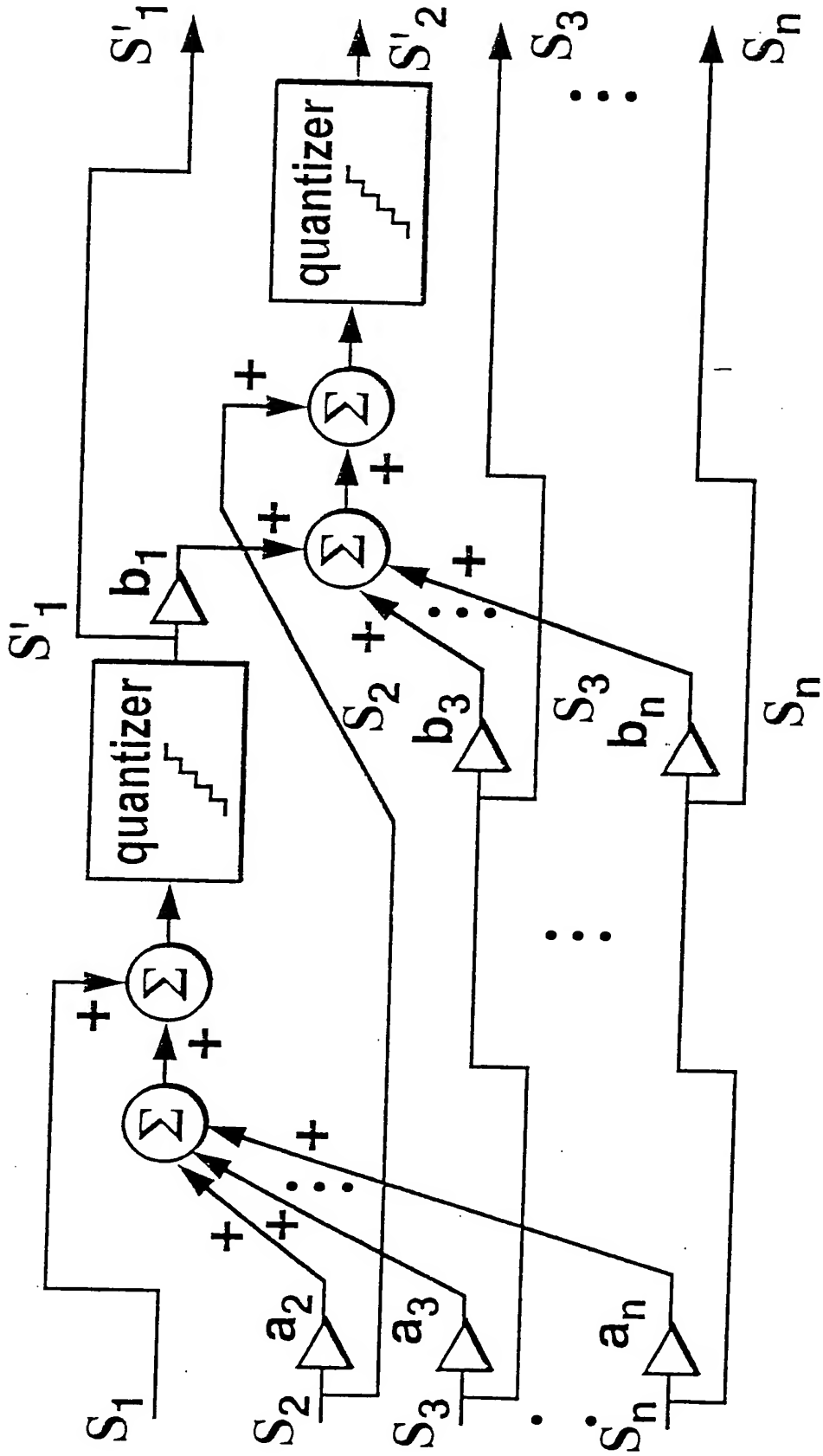


FIG. 23a

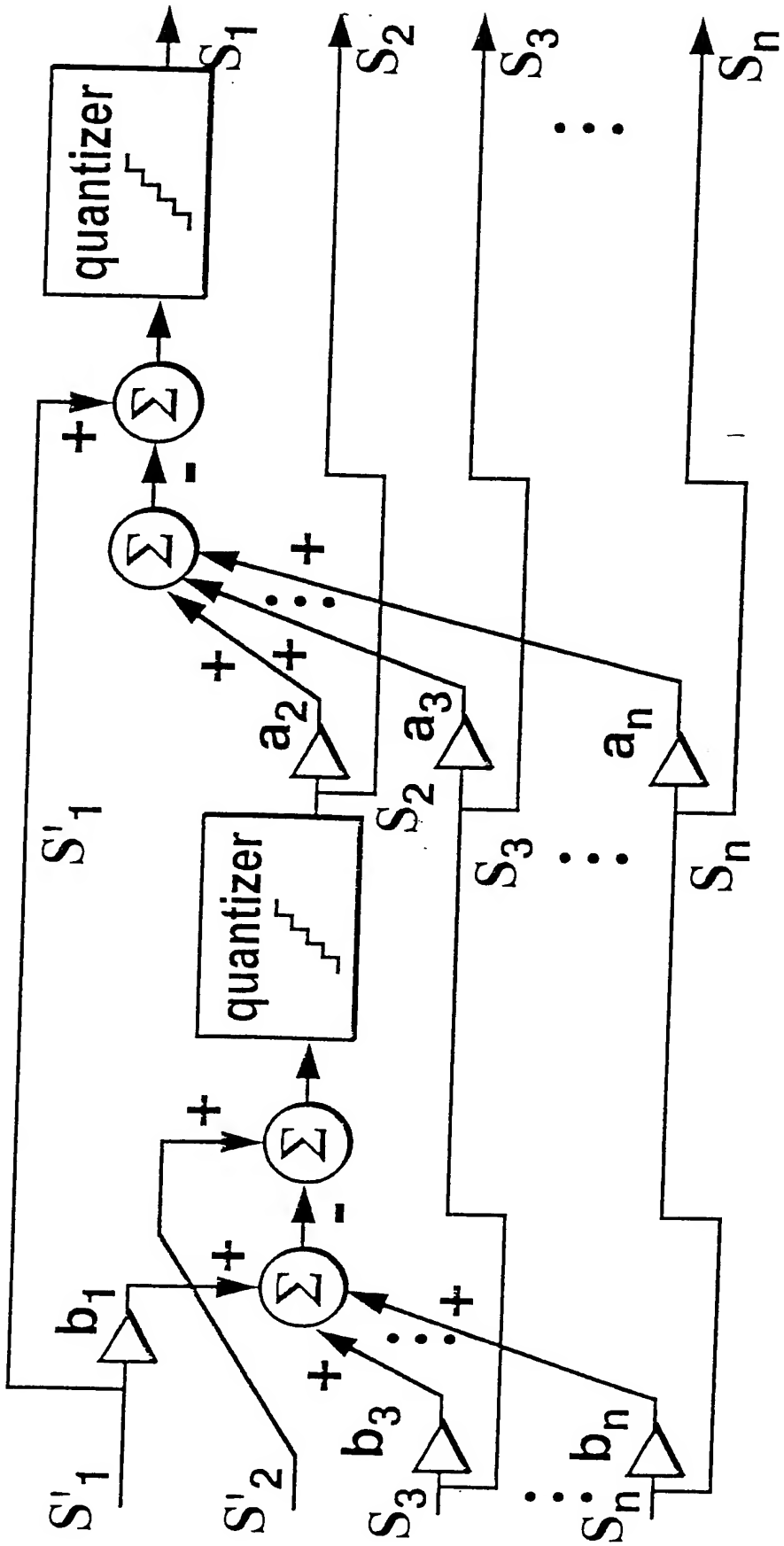


FIG. 23b

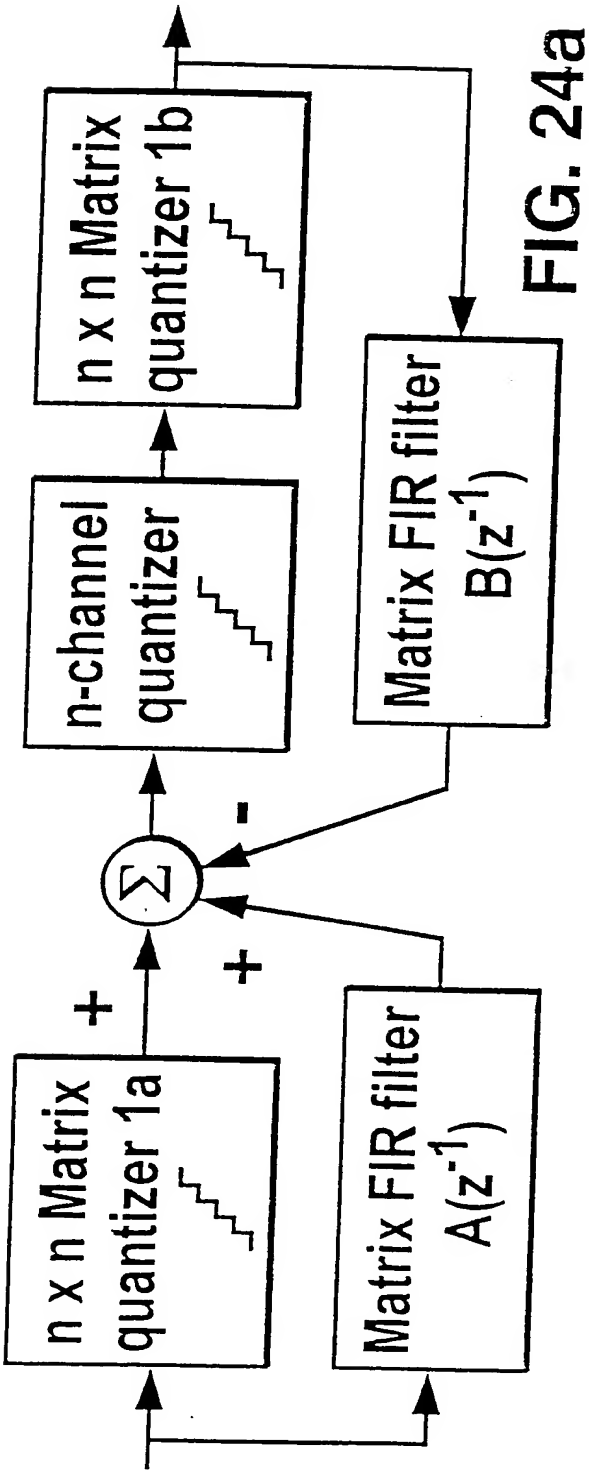


FIG. 24a

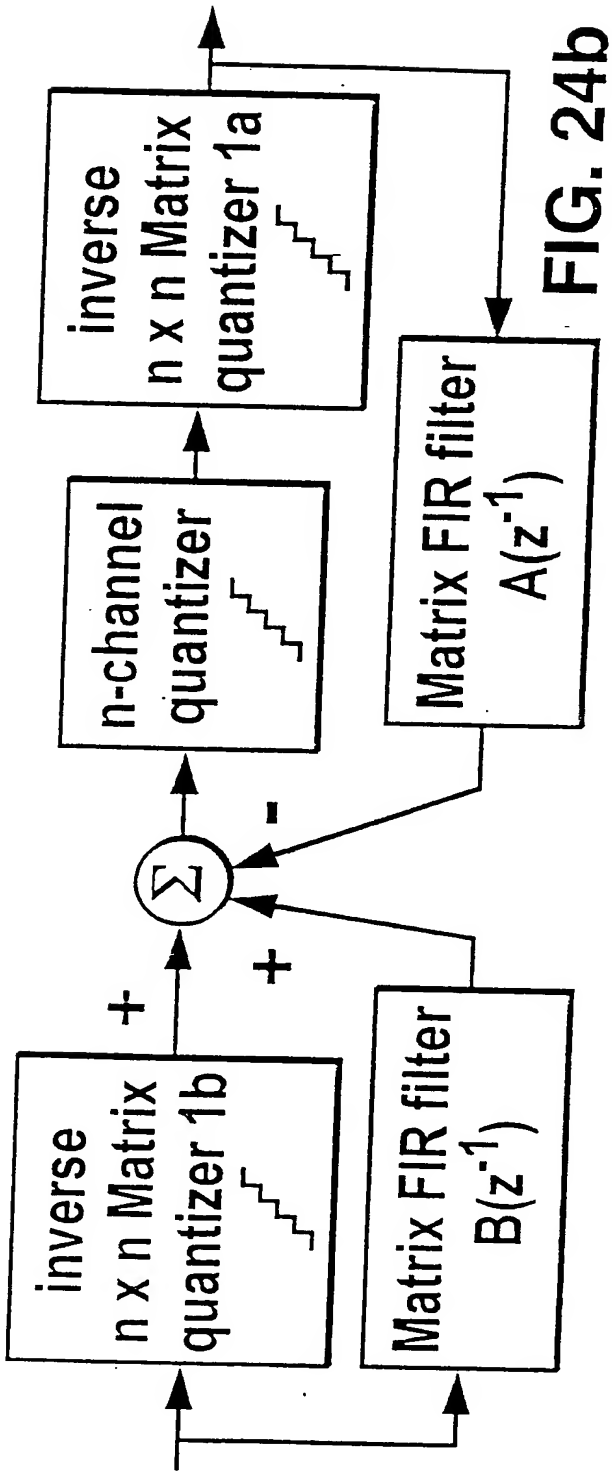


FIG. 24b

FIG. 24c

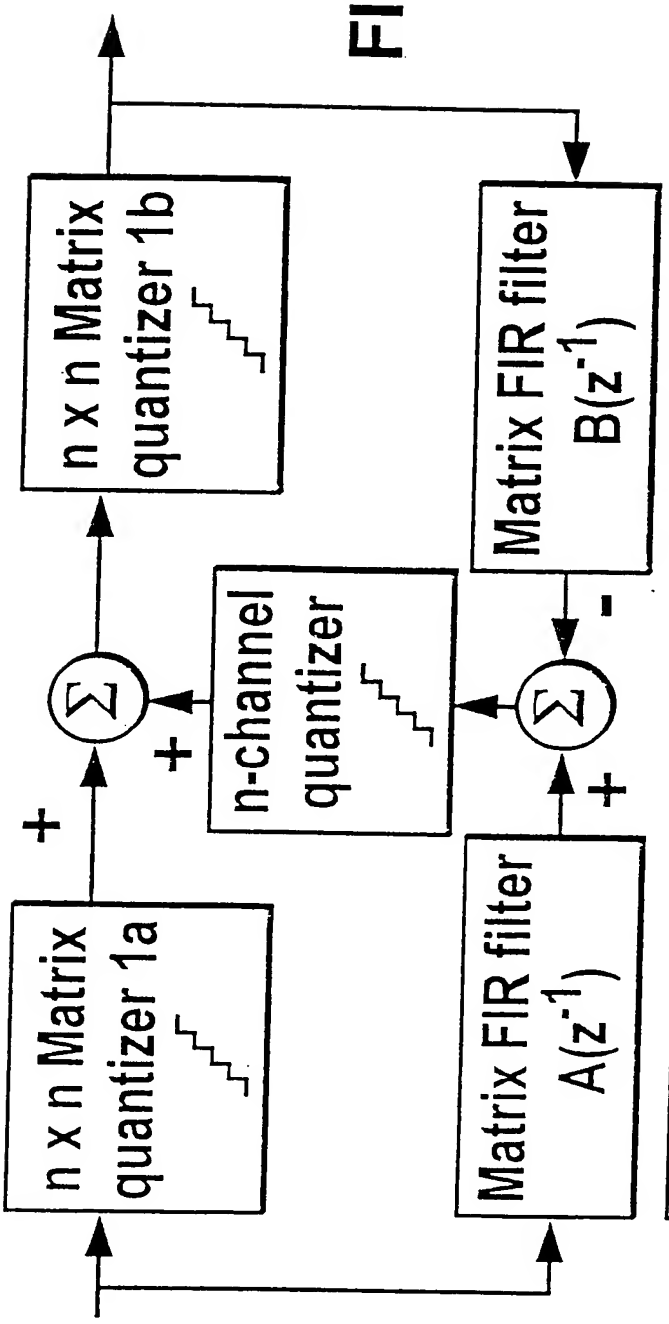
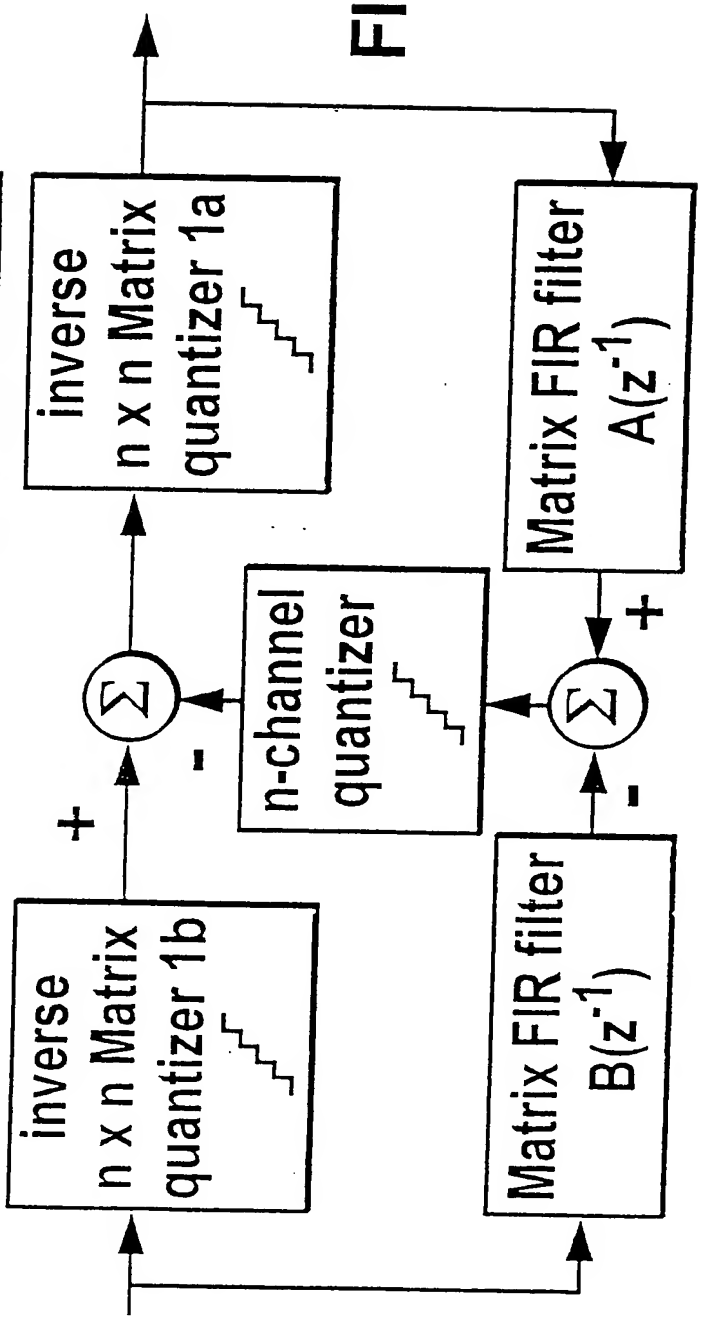


FIG. 24d



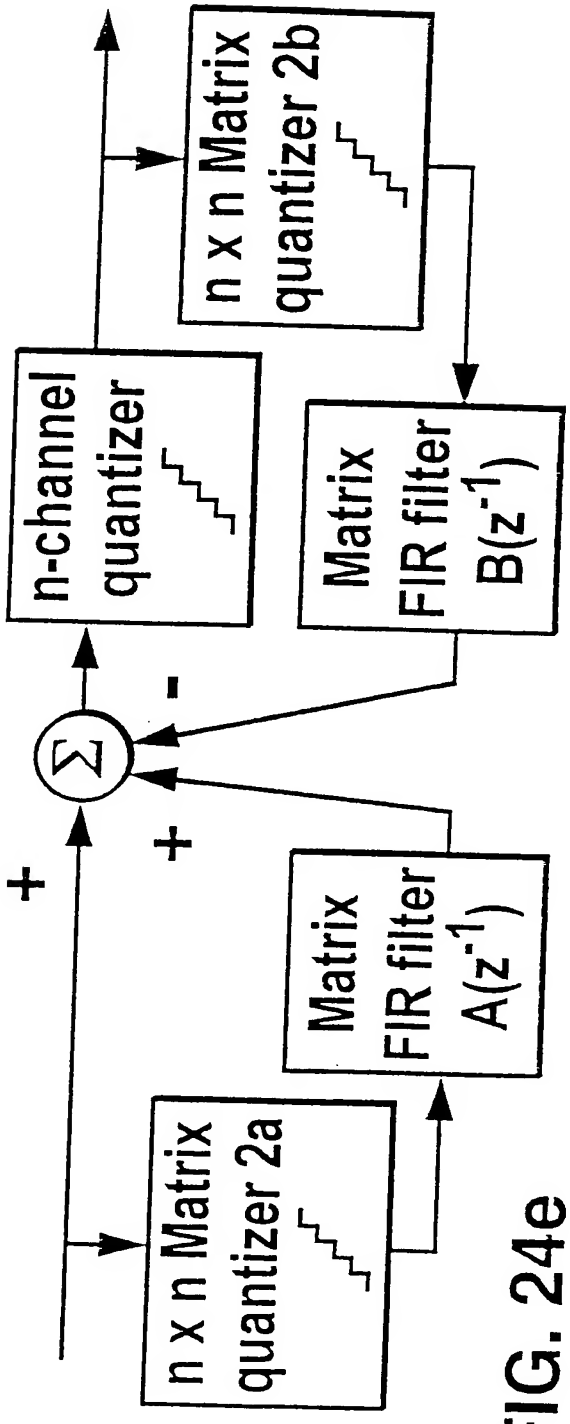


FIG. 24e

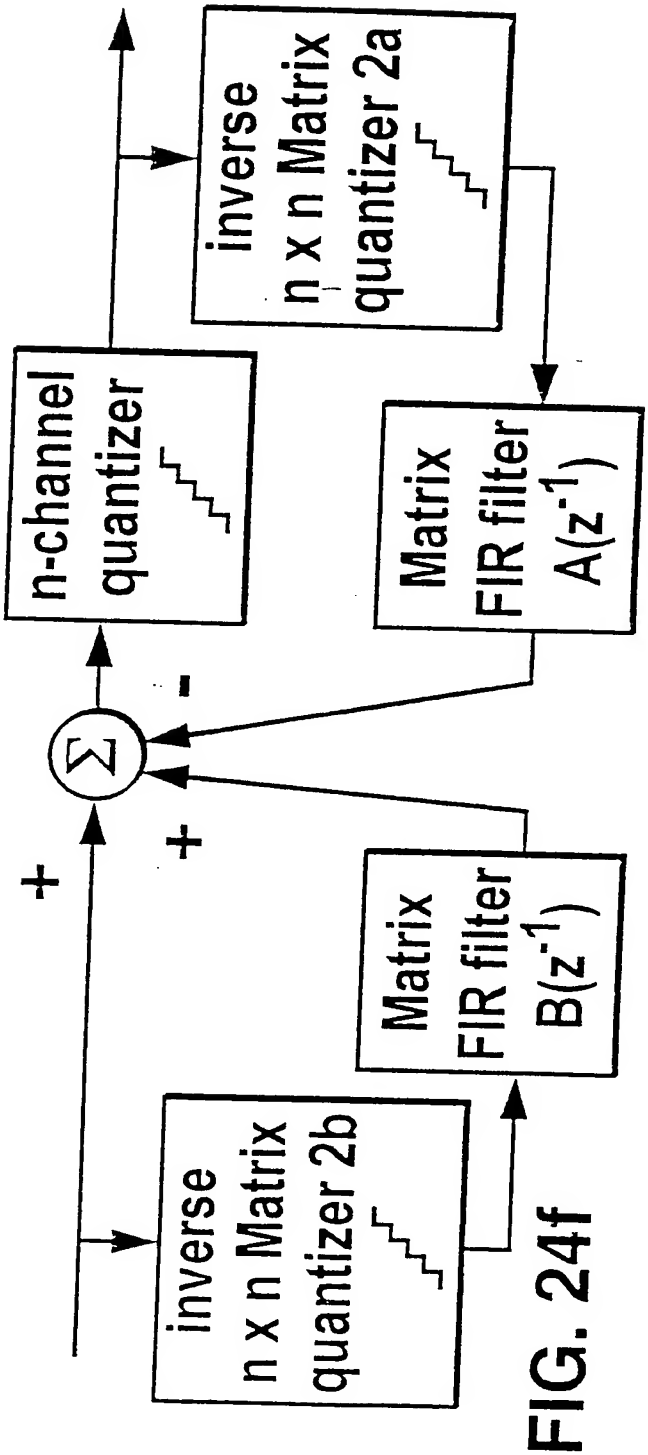


FIG. 24f

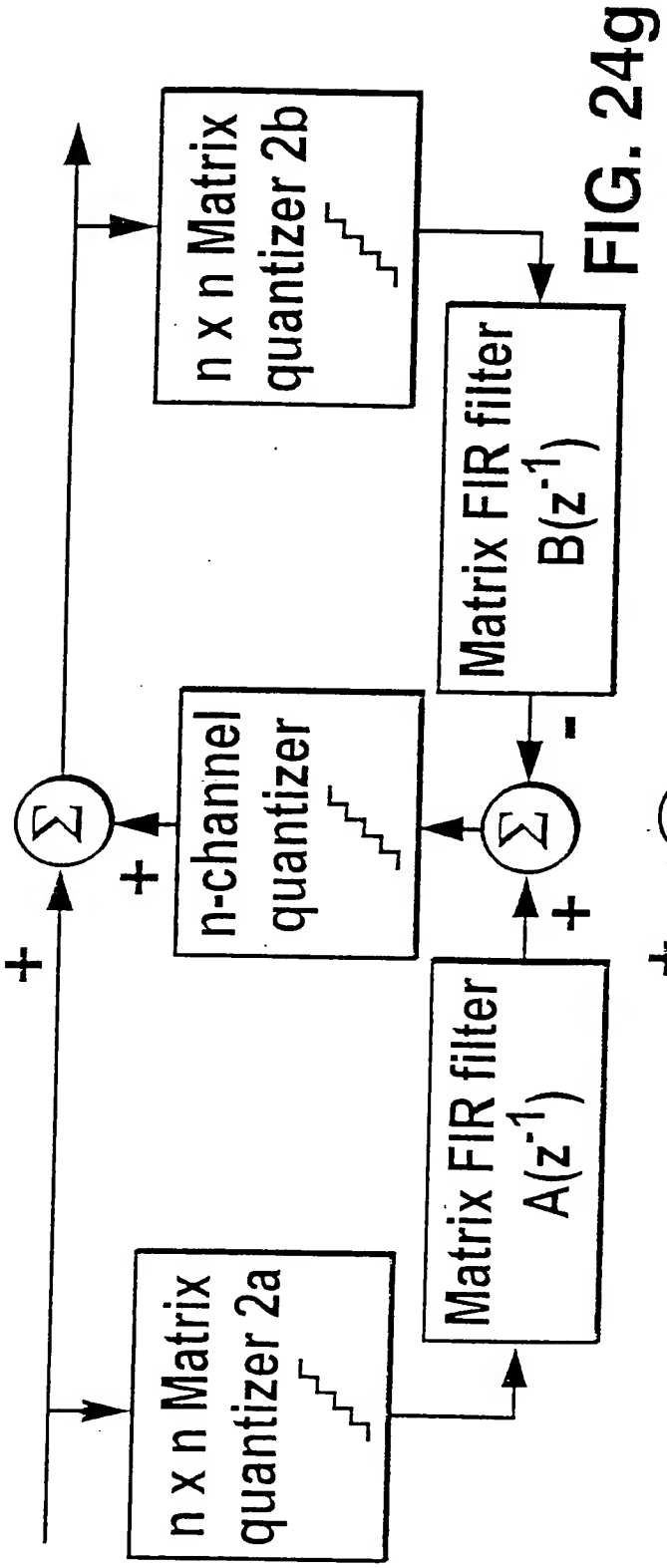


FIG. 24g

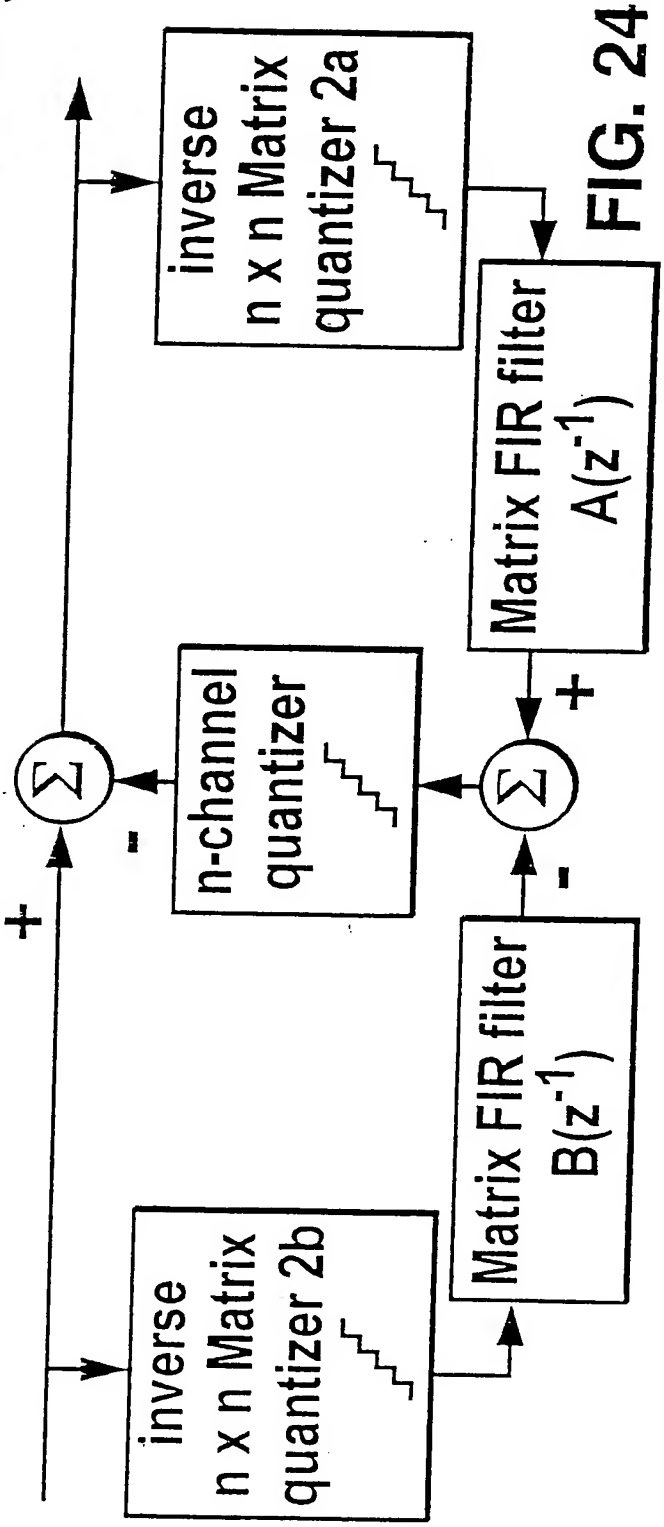


FIG. 24h

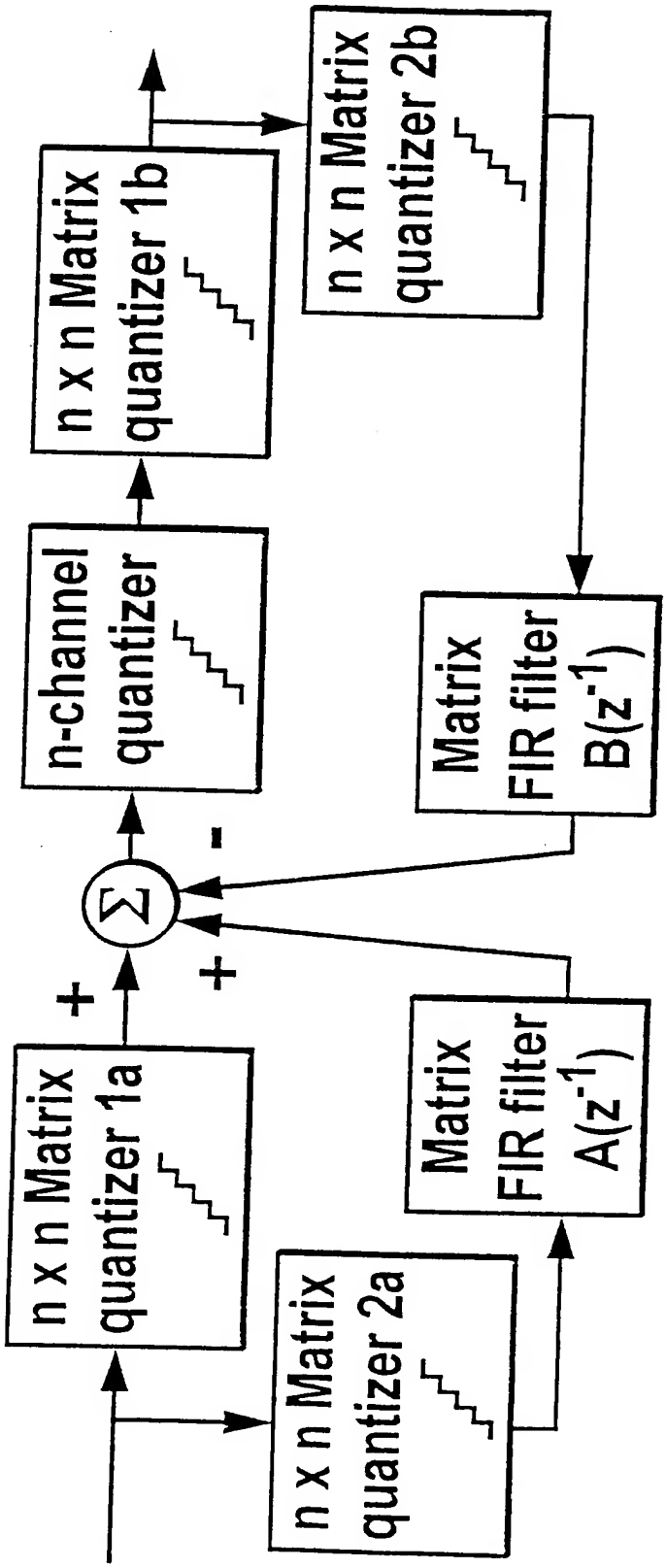

n x n Matrix quantizer 1a
n x n Matrix quantizer 2a
+
+
Σ
-
n-channel quantizer
n x n Matrix quantizer 1b
n x n Matrix quantizer 2b
Matrix FIR filter A(z-1)
Matrix FIR filter B(z-1)

FIG. 24i

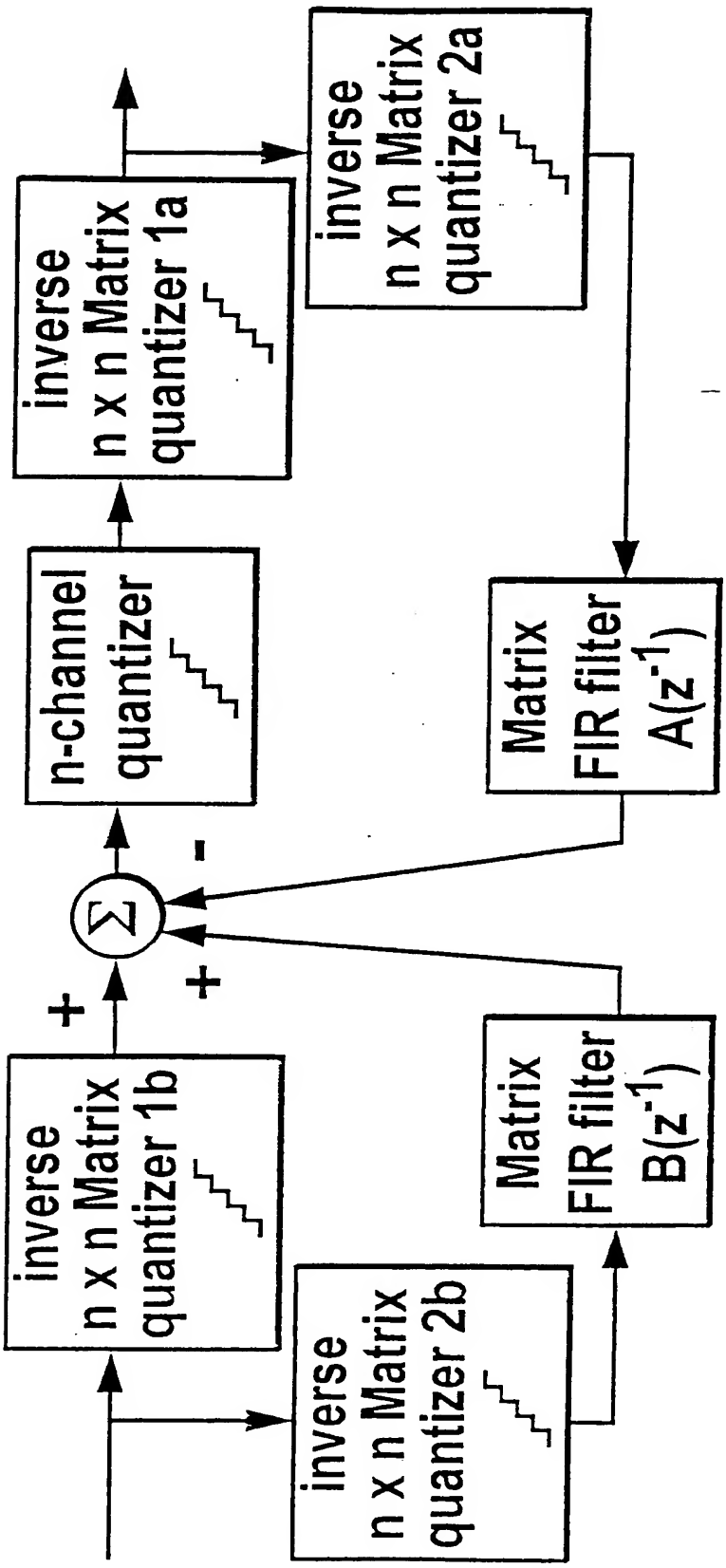

inverse n x n Matrix quantizer 1a
inverse n x n Matrix quantizer 2a
n-channel quantizer
Matrix FIR filter $A(z^{-1})$
Σ
-
+
+
inverse n x n Matrix quantizer 1b
inverse n x n Matrix quantizer 2b
Matrix FIR filter $B(z^{-1})$

FIG. 24j

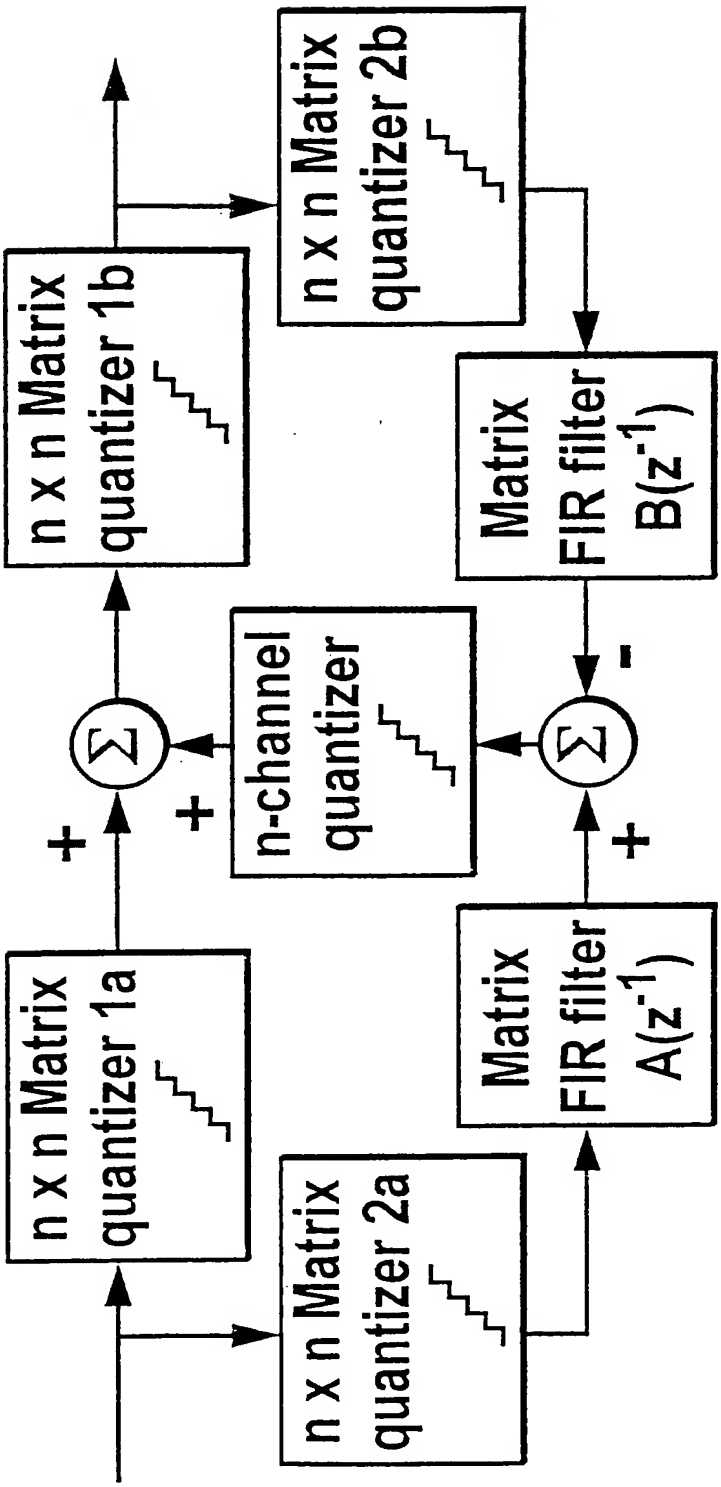

n x n Matrix quantizer 1a
n x n Matrix quantizer 2a
n-channel quantizer
n x n Matrix quantizer 1b
n x n Matrix quantizer 2b
Matrix FIR filter A(z-1)
Matrix FIR filter B(z-1)
+
+
+
-

FIG. 24k

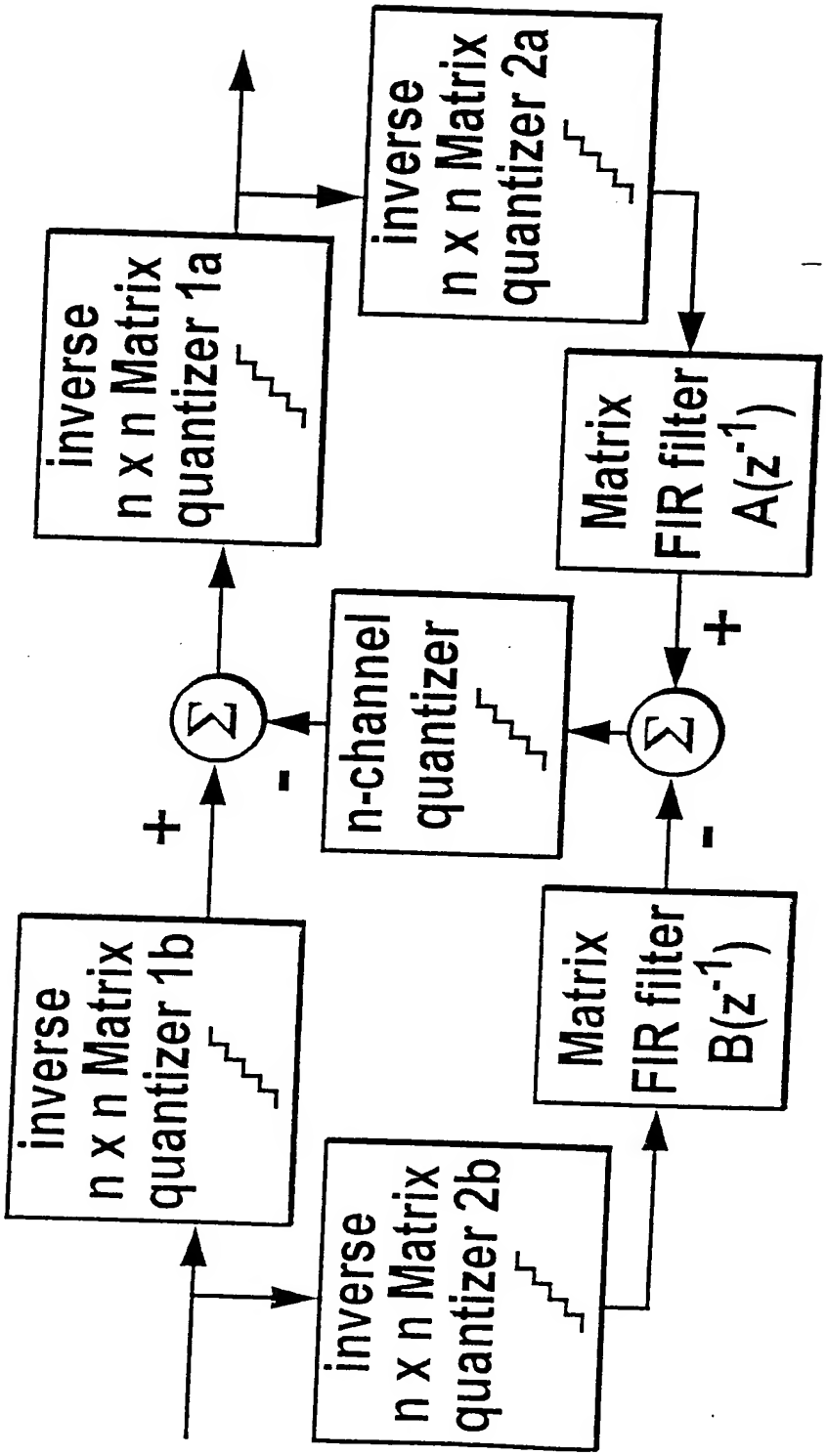

inverse n x n Matrix quantizer 1a
inverse n x n Matrix quantizer 2a
Matrix FIR filter A(z-1)
n-channel quantizer
inverse n x n Matrix quantizer 1b
inverse n x n Matrix quantizer 2b
Matrix FIR filter B(z-1)
Σ
+
-
+
-

FIG. 24I

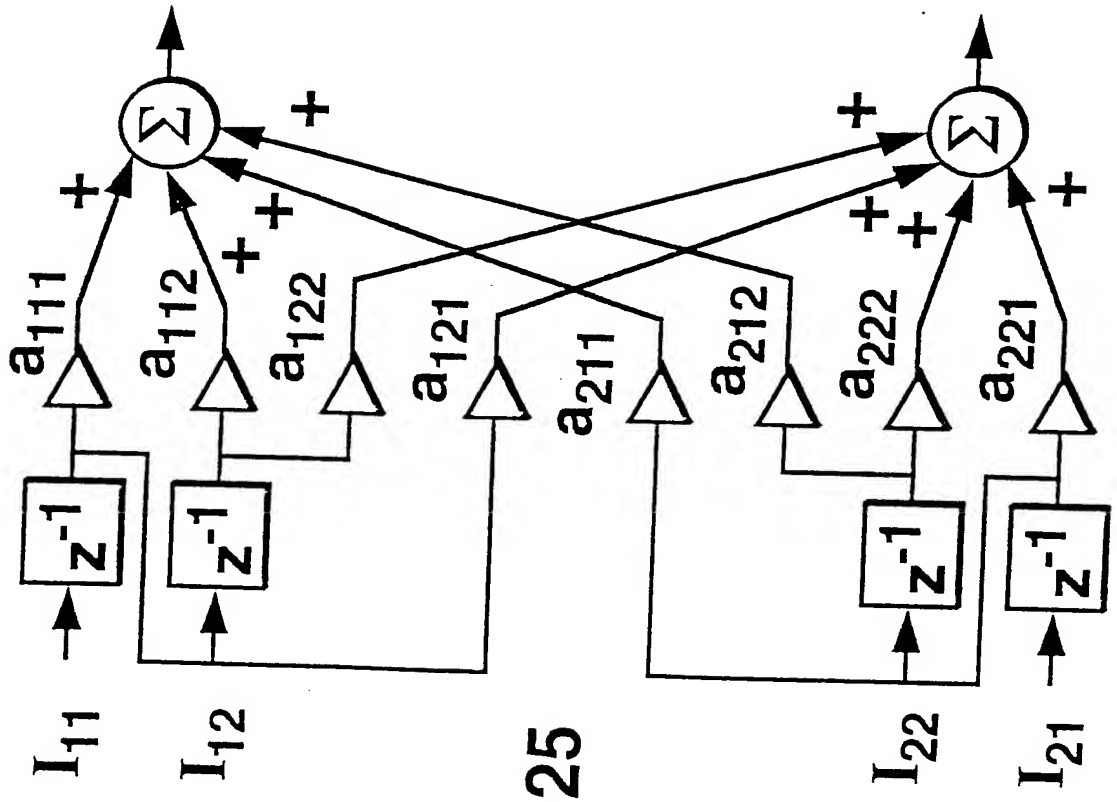

Σ
Σ
+
+
+
+
+
+
+
+
a_{111}
a_{112}
a_{122}
a_{121}
a_{211}
a_{212}
a_{222}
a_{221}
z^{-1}
z^{-1}
z^{-1}
z^{-1}
I_{11}
I_{12}
I_{22}
I_{21}

FIG. 25

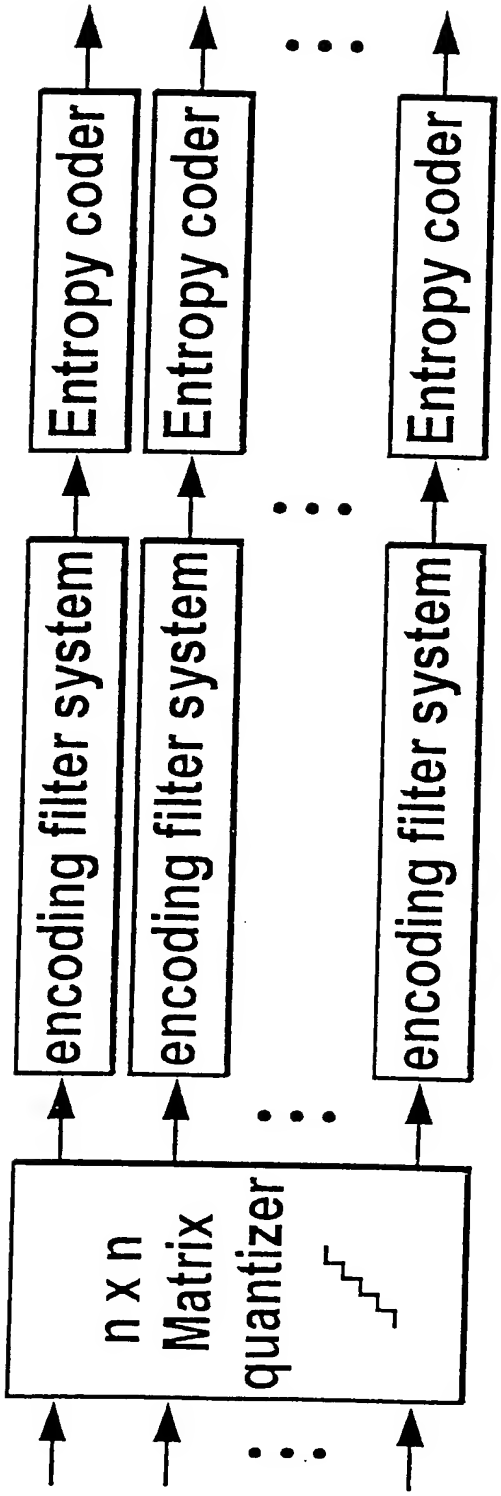


FIG. 26a

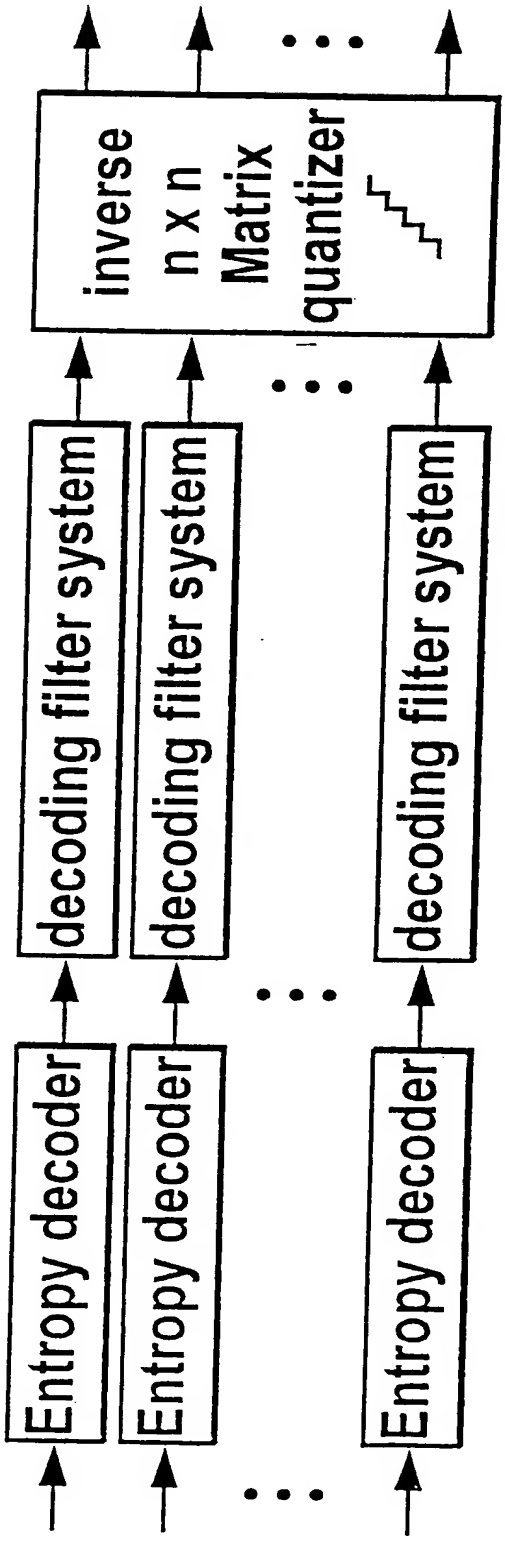


FIG. 26b

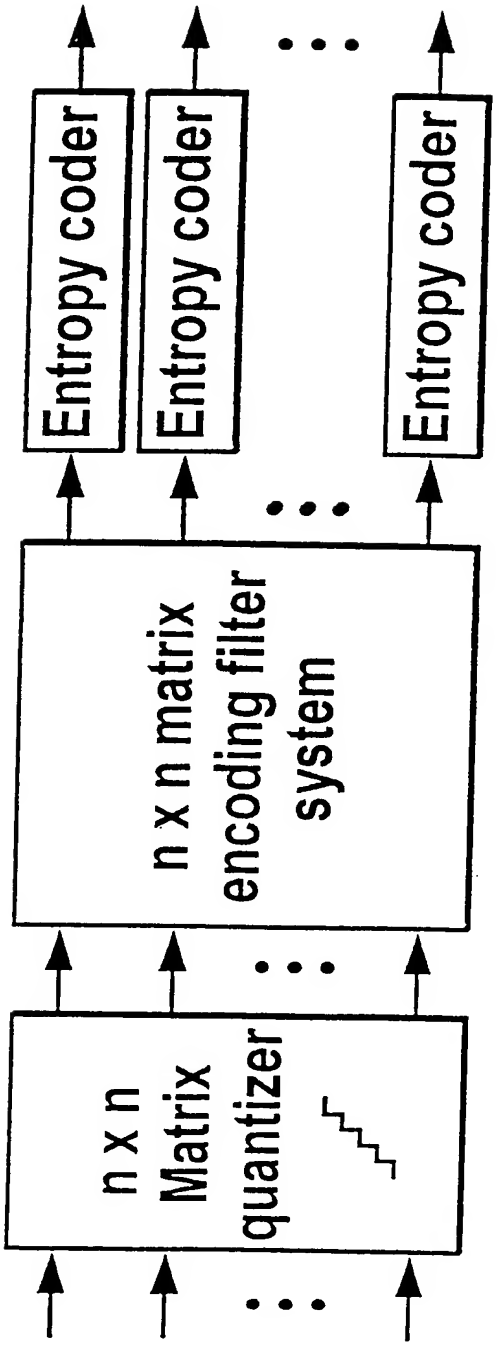


FIG. 26c

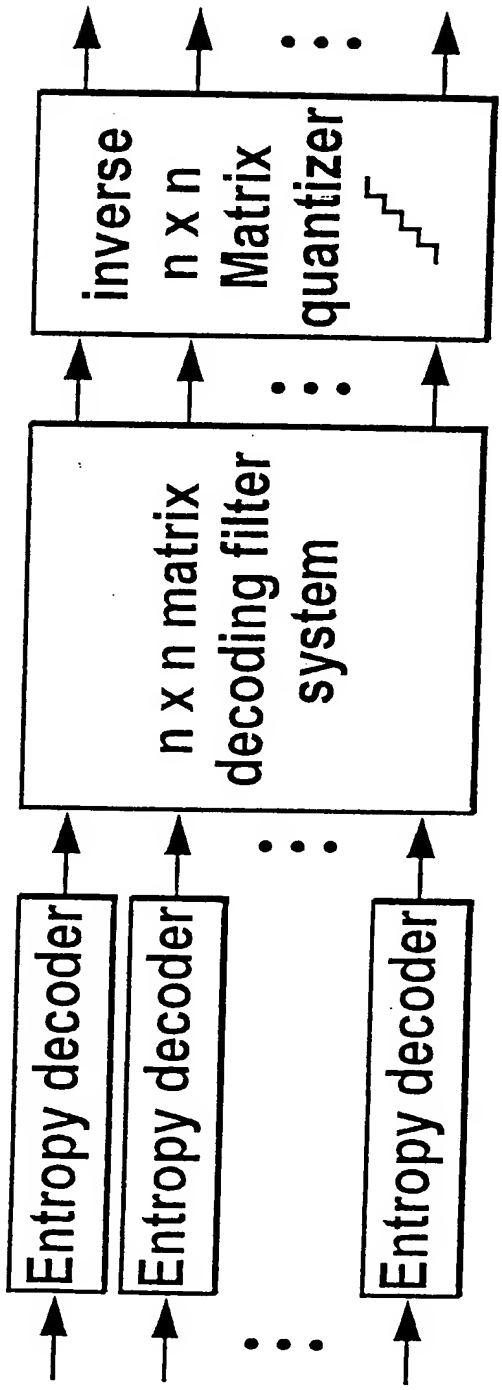


FIG. 26d

Fig.27a.

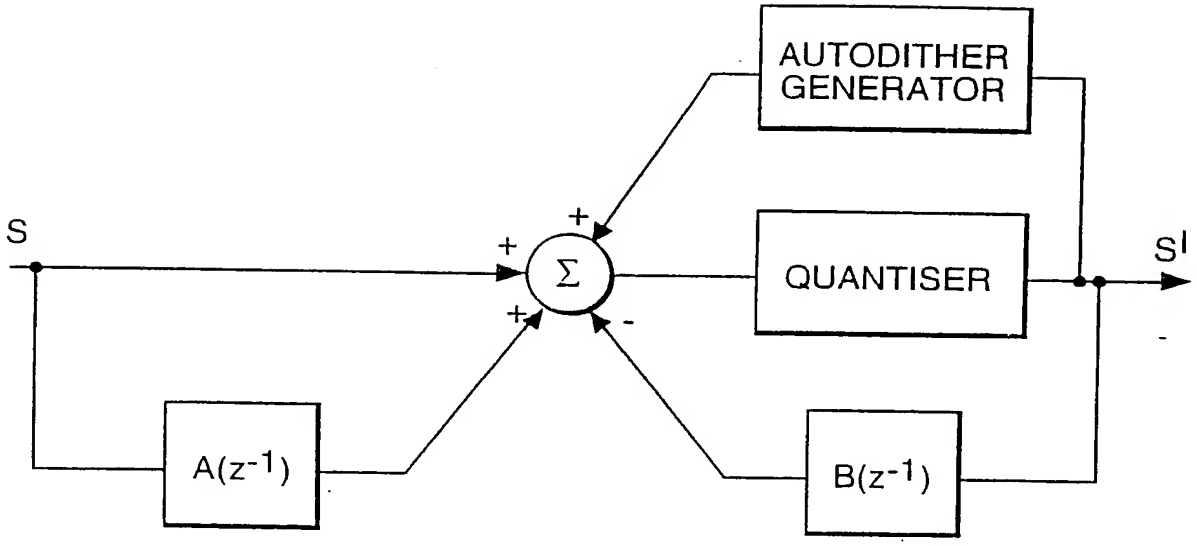


Fig.27b.

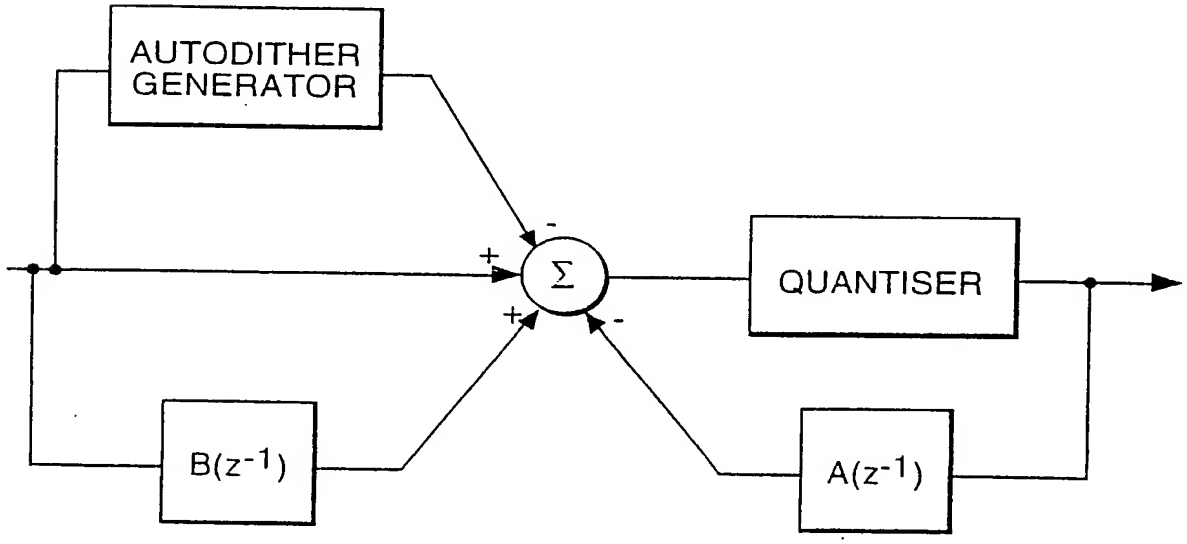


Fig.28a.

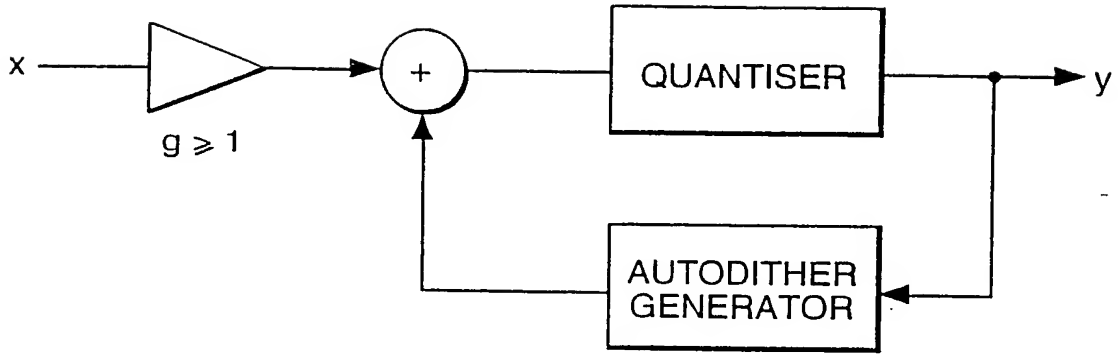
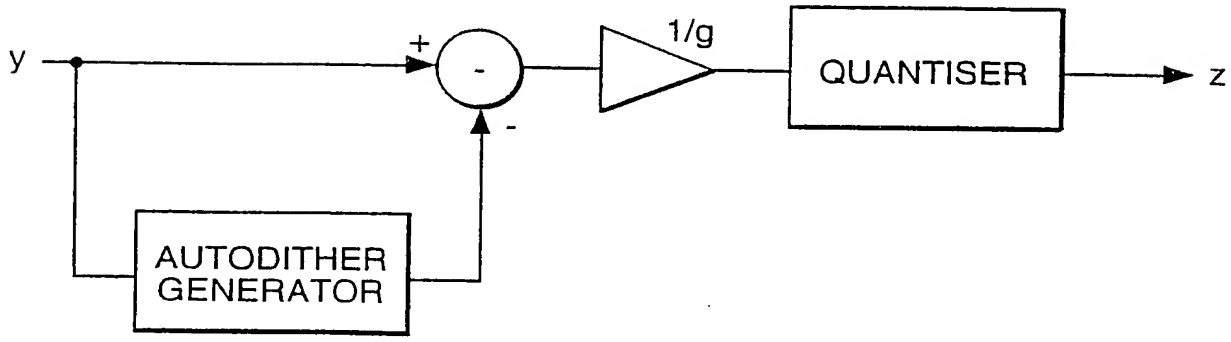



Fig.28b.